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Five new species of the long-jawed orb-weaving spider genus *Tetragnatha* (Araneae, Tetragnathidae) in South America, with a key to the species from Argentina and Brazil

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Abstract

Five new species in the long-jawed orb-weaving spider genus *Tetragnatha* Latreille, 1804 are described from South America: *Tetragnatha amazonica* **sp. nov.** (Venezuela); *T. cristata* **sp. nov.** (Argentina and Brazil); *T. didorata* **sp. nov.** (Brazil); *T. oncognatha* **sp. nov.** (Brazil); and *T. pradoi* **sp. nov.** (Argentina and Brazil). A key to the 21 species of *Tetragnatha* from Argentina and Brazil is provided, completing the revision of the genus for these countries. The female of *T. cladognatha* Bertkau, 1880 is redescribed and a neotype is proposed, and its male is described for the first time. Additionally, we update the taxonomic status of the following six South American species: *Tetragnatha labialis* Nicolet, 1849 and *T. americana* Simon, 1896 are considered new junior synonymies of *T. nitens* (Audouin, 1826); and *Tetragnatha bishopi* Caporiacco, 1947, *T. linearis* Nicolet, 1849, *T. similis* Nicolet, 1849 and *T. sternalis* Nicolet, 1849 are proposed as *nomina dubia* due to missing or juvenile type-material.

Key Words

Taxonomy, systematics, Neotropical Region, Tetragnathinae

Introduction

One distinctive family of Araneomorphae is Tetragnathidae Menge, 1886, whose members usually build typical horizontal prey-capture orb-webs. Currently, 46 described genera and 982 species are distributed worldwide, with 16 genera recorded for the Neotropical region (World Spider Catalog 2022). In the last 15 years, the family was the focus of various taxonomic and systematic publications, including family-level phylogenetic studies and generic revisions (e.g., Dimitrov et al. 2008, 2010; Levi 2008; Álvarez-Padilla et al. 2009; Dimitrov and Hormiga 2011; Cabra-García and Brescovit 2016).

Tetragnathidae was originally divided into two subfamilies, "Metinae" (currently Metainae) and Tetragnathinae (Levi 1986). The original Metainae has not been recovered in recent phylogenetic analyses (Dimitrov and Hormiga 2011; Dimitrov et al. 2017; Álvarez-Padilla et al. 2020) but all three supported a monophyletic Tetragnathinae. This subfamily is currently composed of seven genera: *Antillognatha* Bryant, 1945, *Cyrtognatha* Keyserling, 1881, *Dyschiriognatha* Simon, 1893, *Glenognatha* Simon, 1887, *Hispanognatha* Bryant, 1945, *Pachygnatha* Sundevall, 1823 and *Tetragnatha* Latreille, 1804.

Tetragnatha has a cosmopolitan distribution, comprising 322 described species including nine subspecies (World Spider Catalog 2022). The taxonomy of the genus differs from most other genera among the Tetragnathidae and other families, as it is based mostly on the morphology of the chelicerae and less so on the morphology of genitalia (Castanheira et al. 2019). The che-

liceral morphology of *Tetragnatha* is unique in the different species, especially among males, and are the most important tool for species identification (Castanheira et al. 2019). The terminology of cheliceral teeth was revised in Castanheira et al. (2019) with the nomenclature largely following that of the late Chiyoko Okuma (e.g., Okuma 1987, 1988a, b, 1992) and it is important for the recognition of homologies for future morphological phylogenetic assessments.

Currently, there are verified records for 11 *Tetragnatha* species from Argentina and 16 from Brazil (Castanheira et al. 2019; Castanheira and Baptista 2020; Castanheira and Baptista 2021a, b; Cargnelutti et al. 2022; World Spider Catalog 2022). There is no published key for species from South America or any of its countries.

This study includes an updated description of *Tetragnatha*, a redescription of *Tetragnatha cladognatha* Bertkau, 1880, descriptions of five new species, a key to all species of the genus from Argentina and Brazil, and also additional taxonomic changes concerning some Neotropical species.

Materials and methods

Morphological terminology follows Castanheira et al. (2019) and Castanheira and Baptista (2020). Colour patterns were described based on specimens preserved in 75% ethanol.

Specimens were cleaned using a Cristofoli Ultrasonic Cleaner. They were then positioned in a 70% alcohol gel or glass spheres for automontage photographs and measurements, taken with a Leica DFC450 camera mounted on a Leica M205C stereoscope microscope at the Laboratório de Entomologia, Universidade do Brasil/ Universidade Federal do Rio de Janeiro. All photos and plates were edited and mounted using the software package Photoshop CS5.1. Measurements are given in millimetres. Carapace length was measured from the anterior margin of the clypeus (i.e. excluding the chelicerae) to the posterior border. Total length was measured from the anterior margin of the clypeus to the posterior edge of the abdomen, including the spinnerets. Chelicerae curvature was measured with the use of a protractor. The description of the position of teeth and fang cusps (upward, downward, distalward and basalward) took into account the direction of the chelicerae (Okuma 1983), as morphological terms such as dorsal, ventral, frontal or posterior may be ambiguous depending on the orientation of the chelicerae. The length of the genital fold in females is measured from the posterior rim of the inner angle of the lung-plates to the posterior rim of the fold and it is compared to the span between the outer angle of the posterior rim of one lung-plate to the outer angle of the other one at the opposite side. The term 'spigots' is applied here in favour of 'fusules', which was used in our last publications (e.g., Castanheira et al. 2019). Males and females were matched by general resemblance, chelicerae morphology and collection sites.

For scanning electron microscope (SEM), preparations were submitted to critical point drying techniques and mounted on adhesive copper tape (Electron Microscopy Sciences, EMS 77802), affixed to a stub. Examination was carried out under high vacuum with a JEOL JSM-6510 microscope at Laboratório de Imagens (Labim), Instituto de Biologia, Universidade Federal do Rio de Janeiro (UFRJ). Prior to SEM examination, the structures in all samples were sputter-coated with Au-Pd. To clear female genitalia, an enzyme solution was prepared using a borax solution following Álvarez-Padilla and Hormiga (2008) and digestive enzyme tablets of "Orthoplex D. E. F" (Bioconcepts Pty Ltd) consisting of Pancreatin (200 mg), Bromelain (100 mg) and Trypsin (30 mg).

For map construction, we used the software QGis 3.16.8. Geographic coordinates were extracted directly from original labels. When no coordinate information was available on the label, estimates of the closest nearby locality were extracted from resources such as the Global Gazetteer (version 2.3, available from http://www.fallingrain.com/world/index.html) or Google Earth (version 9.1.39.1, available from https://earth.google.com/web/).

Abbreviations used in the text and images

Structures of chelicera

a male dorsal apophysis, used to lock the fangs of females during copulation.
AXl auxiliary guide tooth of the lower row, present in some species.
AXu auxiliary guide tooth of the upper row, above Gu, present in some species.
BC basal cusp on the cheliceral fang of females.
CB cheliceral bulge, a protruding area between the two rows of teeth, near the base of the fang.
CRu cheliceral crest, a protruding marked area on the upper teeth row.
CRl cheliceral crest, a protruding marked area on the lower teeth row.
Gu guide tooth of the upper (or dorsal) row.
Gl guide tooth of the lower (or ventral) row.
IC inner cusp of fang.
L2–n teeth on the lower row numbered from the distal end after Gl.
MC median cusp of the fang.
OC outer cusp of fang.
rsu remaining proximal teeth on the upper row of males and females after the last specialized tooth, like for example the 'T' in males of some species.
rsl remaining proximal teeth on the lower row of males and females after the last specialized tooth.

sl first major tooth after Gu in the upper row of males (absent in some species).
T elongated tooth in the upper row of some males.
t a tooth or prominence found in males of some species.
U2–n teeth on the upper row numbered from the distal end after Gu.

Other structures

Eyes: **AME** = anterior median eyes and **ALE** = anterior lateral eyes. Male pedipalps: **E** = embolus; **C** = conductor; **P** = paracymbium (including **K** = ectal knob, **L** = mesal translucent lobe, **N** = apical notch); **Y** = cymbium. Female genitalia: **GF** = genital fold; **Sp** = spermatheca; **CS** = central membranous sac.

Collections cited in the text

IBSP Instituto Butantan, São Paulo/SP, Brazil.
MACN Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires, Argentina.
MCTP Museu de Ciência e Tecnologia da Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre/RS, Brazil.
MHNS Museo Nacional de Historia Natural, Santiago, Chile.
MLPC Mello-Leitão´s Private Colletion, at Laboratório de Aracnologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro/RJ, Brazil.
MNHN Musée National d'Histoire Naturelle, Paris, France.
MNRJ Laboratório de Aracnologia, Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro/RJ, Brazil.
MPEG Museu Paraense Emílio Goeldi, Belém/PA, Brazil.
MZUF Università di Firenze, Museo Zoologico "La Specola", Florence, Italy.
MZUSP Museu de Zoologia da Universidade de São Paulo, São Paulo/SP, Brazil.
UFRJ Laboratório de Diversidade de Aracnídeos, Instituto de Biologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro/RJ, Brazil.

Results

Our revision of *Tetragnatha* was based on 120 males, 239 females and 59 juveniles in 13 species for Argentina, and 831 males, 1,038 females and 308 juveniles in 20 species for Brazil, four of which are new to science and herein described (Table 1). Additionally, one new species for Venezuela is described here. The table below summarises the composition of the Argentinian and Brazilian fauna of *Tetragnatha*, the only countries we had substantial material available for examination.

Table 1. Summary of *Tetragnatha* in Argentina and Brazil, local species distribution, remarks and material examined, including records from this paper. (Argentinian provinces: BA = Buenos Aires; CB = Córdoba; CC = Chaco; CB = Córdoba; CN = Corrientes; CT = Catamarca; ER = Entre Ríos; JY = Jujuy; LP = La Pampa; LR = La Rioja; MN = Misiones; MZ = Mendoza; NQ = Neuquén; RN = Río Negro; SA = Salta; SC = Santa Cruz; SE = Santiago del Estero; SF = Santa Fe; TM = Tucumán; Brazilian states: AL = Alagoas; AM = Amazonas; AP = Amapá; BA = Bahia; ES = Espírito Santo; GO = Goiás; MA = Maranhão; MG = Minas Gerais; MS = Mato Grosso do Sul; MT = Mato Grosso; PA = Pará; PB = Paraíba; PE = Pernambuco; PI = Piauí; PR = Paraná; RJ = Rio de Janeiro; RS = Rio Grande do Sul; SC = Santa Catarina; SE = Sergipe; SP = São Paulo; TO = Tocantins).

Species	Distribution in Argentina (provinces)	Distribution in Brazil (states)	Distribution outside Brazil and Argentina according to this study and the World Spider Catalog (2022)	Remarks	Material examined from Argentina (M: males, F: females, J: juveniles)	Material examined from Brazil (M: males, F: females, J: juveniles)
T. argentinensis Mello-Leitão, 1931	BA, CT, CB, ER, MN	MG, MT, PR, RJ, RS, SC, SP	Uruguay	Cargnelutti et al. (2022)	31M, 57F, 11J	75M, 100F, 22J
T. bogotensis Keyserling, 1865	CB, JY, LR, MN, SA, SE, TM	AL, BA, ES, MG, MT, PA, PB, PE, PI, PR, RJ, RS, SC, SP, TO	Mexico to Paraguay, Caribbean, Italy, Africa, Seychelles, Yemen, India, Nepal, Bangladesh, China	Castanheira et al. (2019)	5M, 12F, 1J	114M, 187F, 29J
T. caudata Emerton, 1884	BA	–	North and Central America, Cuba, Jamaica and Uruguay	Castanheira and Baptista (2021b)	1M, 3F	–
T. chauliodus (Thorell, 1890)	–	RJ	China, Japan, Myanmar to Papua New Guinea	Castanheira and Baptista (2020)	–	1M, 1F, 2J
T. cladognatha Bertkau, 1880	MN	ES, MG, MS, PR, RJ, RS, SC, SP	–	neotype provided	6M, 17F, 11J	55M, 95F, 26J
T. cristata sp. nov.	MN	RS, SC, SP	–	female unknown	1M, 4J	29M, 9J
T. didorata sp. nov.	–	PA, PR, RS, SC	–	female unknown	–	4M
T. elongata Walckenaer, 1841	MN	PA, PR, RS, SC	Nearctic and Neotropical Regions	Castanheira et al. (2019)	3M, 6F, 2J	46M, 54F, 5J
T. guatemalensis O. Pickard-Cambridge, 1889	–	MS, RO, RS, SC, SP, TO	North and Central America, Cuba, Jamaica, Paraguay	Castanheira and Baptista (2021a)	–	16M, 43F
T. jaculator Tullgren, 1910	MN	MA, MG, MS, PA, PB, PE, PR, RJ, RS, SC, SE, SP	Africa to China, New Guinea. Introduced to the Caribbean and South America	Castanheira and Baptista (2021a)	1M	87M, 35F, 28J

Species	Distribution in Argentina (provinces)	Distribution in Brazil (states)	Distribution outside Brazil and Argentina according to this study and the World Spider Catalog (2022)	Remarks	Material examined from Argentina (M: males, F: females, J: juveniles)	Material examined from Brazil (M: males, F: females, J: juveniles)
T. keyserlingi Simon, 1890	–	AL, AM, MS, PA, PR, RJ, RS, SP, TO	Central America, Caribbean, Africa, Korea, China, India to Philippines, New Hebrides (Vanuatu), Polynesia	Castanheira et al. (2019)	–	18M, 25F, 7J
T. laboriosa Hentz, 1850	NQ, RN, SC	RS, SE, SP	Alaska to Chile, Falkland Is.	Castanheira and Baptista (2021a)	24M, 33F, 9J	6M, 3F, 5J
T. mandibulata Walckenaer, 1841	–	AM, AP, ES, MS. MT, PA, RJ, SP	Central America, Caribbean, Colombia, Guyana, West Africa, India to Philippines, Australia	Castanheira et al. (2019)	–	11M, 37F, 2J
T. megalocera Castanheira & Baptista, 2020	–	ES, RJ, RS, SC, SP	–	Castanheira and Baptista (2020)	–	35M, 27F, 29J
T. nitens (Audouin, 1826)	BA, CC, CB, CN, CT, ER, LP, LR, MZ, MN, RN, SC, SF	ES, GO, MG, MT, MS, PA, PB, PE, PI, PR, RJ, RS, SC, SP, TO	Tropical and subtropical Asia. Introduced: Americas, Macaronesia, Mediterranean, Madagascar, Pacific Is., New Zealand	Castanheira et al. (2019)	46M, 107F, 20J	276M, 370F, 118J
T. oncognatha sp. nov.	–	RJ, RS, SC, SP	–	–	–	13M, 5F, 1J
T. paraguayensis (Mello-Leitão, 1939)	MN	MS, SP	Paraguay	male unknown – Castanheira and Baptista (2021b)	1F	2F
T. pradoi sp. nov.	BA	RS	–	male unknown	2F	1F
T. renatoi Castanheira & Baptista, 2020	MN	PE, PR, RO, RS, SC, SP	Venezuela	Castanheira and Baptista (2020)	1M, 1F	18M, 1F
T. tenuissima O. Pickard-Cambridge, 1889	MN	AM, AP, BA, ES, MT, MS, PA, PE, PI, PR, RJ, SE, SP	Mexico, Central America, Caribbean	Castanheira and Baptista (2020)	1M	20M, 36F, 25J
T. vermiformis Emerton, 1884	–	MS, MT, PB, PE, PR, RJ, RS, SP	Temperate and tropical Asia. Introduced to North, Central America, South America	Castanheira et al. (2019)	–	7M, 16F, 3J

Tetragnatha nitens was the most abundant species examined during this study, with 173 specimens (46 males, 107 females and 20 juveniles) from Argentina and 764 specimens (276 males, 370 females and 118 juveniles) from Brazil. It was also the most widespread, occurring in 12 provinces in Argentina and, alongside *T. bogotensis*, in 15 Brazilian states. Therefore, our data support the status of *T. nitens* as the world`s most widespread and common *Tetragnatha* species.

In Argentina, the second most widespread species was *T. bogotensis* (seven provinces), followed by *T. argentinensis* (five provinces). There were no species exclusively known from Argentina. Among the species we studied, *T. caudata* has not yet been found in Brazil, but besides Argentina, it also occurs in Uruguay, North and Central America and the Caribbean. *Tetragnatha tenuissima* (known from 13 states) and *T. jaculator* (12 states) are the third and fourth most widespread species in Brazil. *Tetragnatha didorata* sp. nov., *T. megalocera* and *T. oncognatha* sp. nov. are currently the only species endemic to Brazil.

There were nine species limited to only one Argentinian province: *T. caudata* and *T. pradoi* sp. nov. (both found in Buenos Aires), and *T. cladognatha*, *T. cristata* sp. nov., *T. elongata*, *T. jaculator*, *T. paraguayensis*, *T. renatoi* and *T. tenuissima* (all found in Misiones). In contrast, only two species were found in a single Brazilian state: *T. chauliodus* (likely introduced from Asia), with a single record for Rio de Janeiro state, and *T. pradoi* sp. nov., for Rio Grande do Sul state.

Taxonomy

Class Arachnida Cuvier, 1812
Order Araneae Clerck, 1757

Family Tetragnathidae Menge, 1866

Tetragnatha Latreille, 1804, Tableau Méthodique des Insectes, in Nouveau Dictionnaire d'Histoire Naturelle, 24: 135.

Eugnatha Audouin in Savigny, 1825, Explications sommaires des Planches d'Arachnides de l'Egypte et de la Syrie, p. 119.

Eucta Simon, 1881, Arachnides de France, 5: 5 (Type species by monotypy *E. gallica* Simon, 1881).

Arundognatha Wiehle, 1963, Tetragnathidae in Tierwelt Deutschlands, 49: 47. (Type species *T. striata* L. Koch, 1862 designated by Wiehle 1939).

Type-species. *Tetragnatha extensa* (Linnaeus, 1758)

Diagnosis. *Tetragnatha* differs from *Dolichognatha*, *Pachygnatha* and *Glenognatha* by its elongate and tubular-shaped abdomen, normally covered by guanine crystals. It further differs from *Dolichognatha* in lacking an epigynum (having a genital fold instead) (Figs 1H, 15H), by having trichobothria on their femora (Fig. 1A–C, 2A–C, 6A–C), a modified cymbium with its tip elongate and thin and a free paracymbium (e.g., Figs 2I, J, 6I, J, 7I, J). From *Glenognatha* and *Pachygnatha*, it may be identified by the absence of a tapetum on the lateral eyes (see Levi 1981) and by the more horizontal and forward projecting chelicerae (e.g., Figs 10A, 18A, B). From *Glenognatha*, it differs by the normal position (not advanced) of the

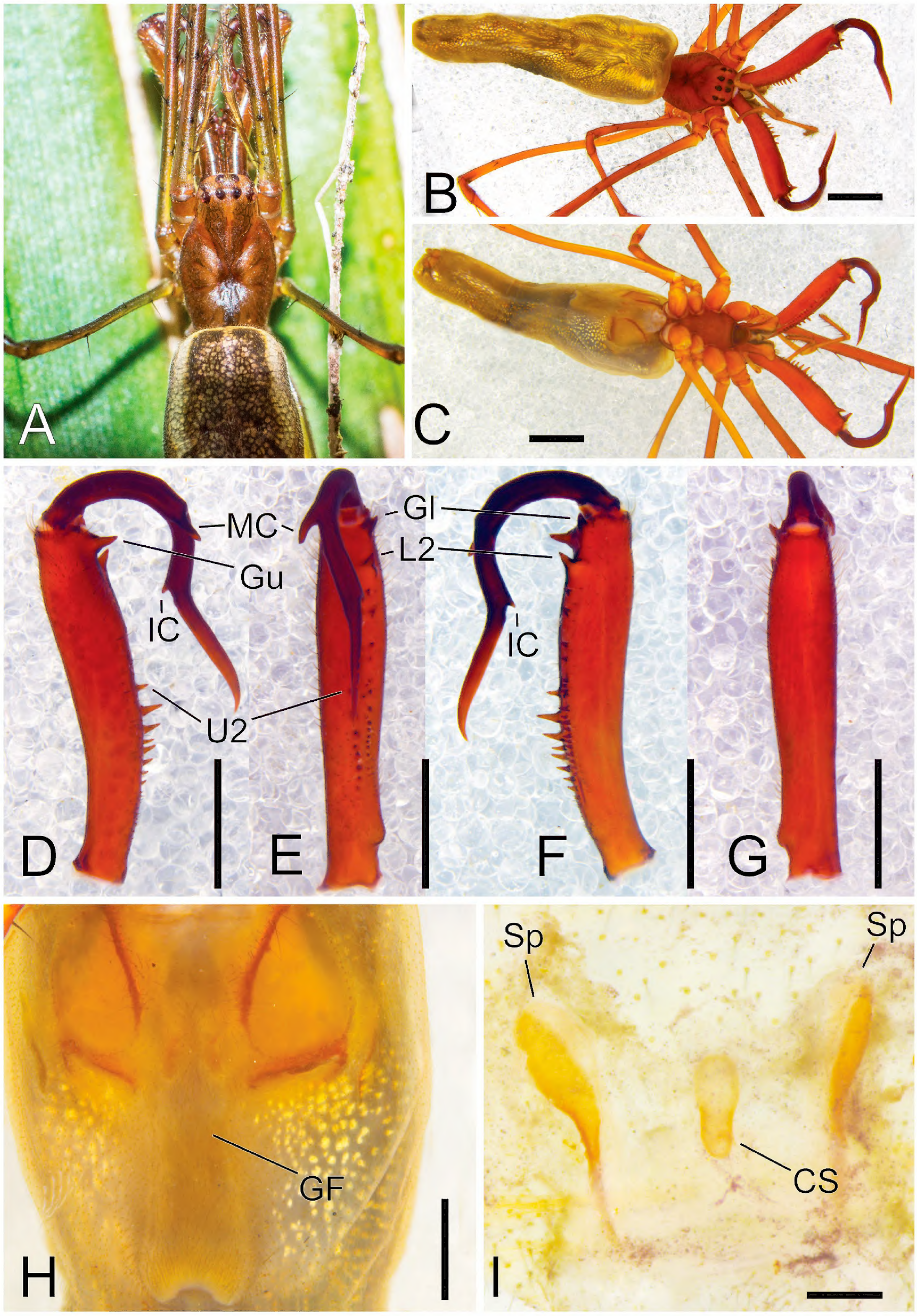


Figure 1. *Tetragnatha cladognatha* female. **A.** Live specimen, dorsal view (carapace and chelicerae); **B–H.** Neotype female (UFRJ 1628); **B.** Dorsal habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–I.** Female genitalia; **H.** Genital fold, ventral view; **I.** Internal genitalia, dorsal view (UFRJ 1524). Scale bars: 2 mm (**B, C**); 1 mm (**D–G**); 0.5 mm (**H**); 0.1 mm (**I**). Photo of live specimen: Ederson Oliveira.

tracheal spiracle (Cabra-Garcia and Brescovit 2016). From *Pachygnatha*, it may be distinguished by the sternum not projecting between the coxae, the carapace not covered with short macrosetae immersed in pits and the absence of the sclerotized genital slit (Dimitrov and Hormiga 2009; Alvarez-Padilla and Hormiga 2011). Adult *Tetragnatha* build orb-webs, while adult *Pachygnatha* do not spin webs. Additionally, *Tetragnatha* differs from *Cyrtognatha* by the more elongated abdomen, the absence of the straight line of long and robust macrosetae with enlarged bases on the spinnerets, male pedipalps with paracymbium as a separate sclerite connected to the cymbium by a membrane on its base, and females with enlarged spermathecae (reduced in *Cyrtognatha*) (Figs 1B, I, 2A, B, H, J; Dimitrov and Hormiga 2009).

Description. Carapace longer than wide, normally with an elevated anterior part, without projections or bands (e.g., Figs 1A, B, 2A, B, 6A, B). Eyes normally large, ringed in black, with touching ALE and PLE in some species (e.g., Fig. 6A, B). Fovea normally small and visible (e.g., Figs 1A, B, 2A, B). Sternum oval, longer than wide, sometimes with dusky edges, with or without a dark contour (e.g., Figs 1C, 2C, 6C, 7C). Legs varying from pale yellow to light brown, legs I and II normally slightly darker than III and IV, all very long, leg formula I–II–IV–III or I–IV–II–III, leg I always much longer than all others, twice as long as leg III and sometimes having multiple spines on femur (e.g., Figs 1A, B, 2A, B, 6A, B). Chelicerae elongated, with paturon bearing bulges or crests in some species (Figs 6D, F, 7D, F, 14D, F) and abundant teeth on both sides, with males bearing a dorsal apophysis to lock female's fangs and additional or modified teeth, such as 'sl', 't' and 'T' (Figs 2D–G, 6D–G, 7D–G, 10D–G, 14D–G); fangs may have basal (BC), outer (OC), inner (IC) or median cusps (MC) (e.g., IC and MC in Fig. 1D–F or BC in Castanheira et al. 2019, fig. 12D–F). Abdomen longer than carapace, normally covered by guanine crystals, without tubercules or spines, sometimes with a projection after the spinnerets varying from short (e.g., Fig. 10B, C) to extremely elongated (Castanheira and Baptista 2021b, figs 1B, C, 2 B, C, 4A, B). Male pedipalps with elongated cymbium, as long (e.g., *T. elongata*) or longer than the tibia (e.g., *T. vermiformis*) (Castanheira et al. 2019, figs 5H, 17H–J, 19C). Tibia very short (e.g., *T. jaculator*) (Castanheira and Baptista 2021a, figs 63–65, 78), short (e.g., *T. cristata* sp. nov., *T. oncognatha* sp. nov.) (Figs 7H–J, 8C, 14H–J), or elongated (e.g., *T. elongata*, *T. nitens*) (Castanheira et al. 2019, figs 5H, 14G–I, 16E). Tegulum oval, always wider than long, slightly (e.g., *T. elongata*, Castanheira et al. 2019, fig. 5H) or extremely slanted (e.g., *T. jaculator*, Castanheira and Baptista 2021a, figs 63–65, 78). Conductor always twisted, with pleats varying from three (e.g., *T. elongata*) (Castanheira et al. 2019, figs 5H, I, 7C, D) to zero (e.g., *T. cristata* sp. nov. (Figs 7H, 8C), and tip of conductor and embolus with or without tail-like projections (Castanheira et al. 2019, fig. 20A–F). Embolus tip may be completely covered by the pouch-like conductor (e.g., *T. bogotensis*) (Castanheira et al. 2019, figs 1I, J, 3A, E, 20A), partially exposed (e.g., *T. argentinensis*; *T. cristata* sp. nov.) (Figs 7H, I, 8C, D; Cargnelutti et al. 2022, figs 2H, I, 3E, F) or completely apart from the conductor (e.g., *T. amazonica* sp. nov.; *T. tenuissima*) (Fig. 6H, I; Castanheira and Baptista 2020, figs 12G, H, 14E, F). Paracymbium may be very elongated (e.g., *T. bogotensis*; *T. nitens*) (Castanheira et al. 2019, figs 1K, 3D, 14J, 16F) or reduced in size (e.g., *T. amazonica* sp. nov.; *T. jaculator*) (Fig. 6J; Castanheira and Baptista 2021a, figs 65, 80). Paracymbium notch (N) can be carved in two parts (e.g., *T. bogotensis*, *T. nitens*) (Castanheira et al. 2019, figs 1K, 3D, 14I, J, 16F), slightly dented (e.g., *T. cristata* sp. nov., *T. oncognatha* sp. nov.) (Figs 7J, 8E, 14J, 16G) or rounded and not divided (e.g., *elongata*, *T. keyserlingi*) (Castanheira et al. 2019, figs 5K, 7F, 8J, 10E); Paracymbium translucent lobe (L) can be very broad (e.g., *T. nitens*, *T. chauliodus*, *T. renatoi*) (Castanheira et al. 2019, figs 14I, J, 16F; Castanheira and Baptista 2020, figs 4I, 6F, 9K), reduced (e.g., *T. keyserlingi*) (Castanheira et al. 2019, figs 8J, 10E) or not visible (e.g., *T. elongata*, *T. vermiformis*) (Castanheira et al. 2019, figs 5K, 7F, 17J, 19E). Female genital fold varies from short and wider than long, with straight or curved posterior rim (e.g., *T. megalocera*, *T. renatoi*, *T. tenuissima* (Castanheira and Baptista 2020, figs 2H, 5H, 13G), to extremely elongated and longer than wide, with rounded posterior rim (*T. cladognatha*, *T. bogotensis*, *T. keyserlingi*, *T. mandibulata*, *T. nitens*, *T. pradoi* sp. nov.) (Figs 1H, 18G; Castanheira et al. 2019, figs 2G, 9H, 12H, 15J). Female internal genitalia usually with central membranous sac (CS), but it is sometimes absent (e.g., *T. vermiformis*, *T. laboriosa*) (Castanheira et al. 2019, fig. 18I; Castanheira and Baptista 2021a, fig. 47). CS may have its head varying from rounded or oval (e.g., *T. oncognatha* sp. nov., *T. bogotensis*, *T. mandibulata*, *T. nitens*) (Fig. 12I; Castanheira et al. 2019, figs 2H, I, 12I, 15K, L) to cylindrical or thin and slender (e.g., *T. pradoi* sp. nov., *T. tenuissima*) (Fig. 15H; Castanheira and Baptista 2020, fig. 13H), with variable stalk length, from short (e.g., *T. oncognatha* sp. nov., *T. bogotensis*) (Fig. 15I; Castanheira et al. 2019, fig. 2H, I) to very elongated (*T. keyserlingi*) (Castanheira et al. 2019, fig. 9I), or even having either long or short stalks depending on the specimen (*T. nitens*) (Castanheira et al. 2019, fig. 15K, L). Spermathecae varies in number, either two (one on each side) (e.g., *T. cladognatha*, *T. elongata*, *T. mandibulata*) (Figs 1I, 3I; Castanheira et al. 2019, figs 6H, 12I), but sometimes four (e.g., *T. megalocera*, *T. guatemalensis*, *T. laboriosa*) (Castanheira and Baptista 2020, fig. 2I; Castanheira and Baptista 2021a, figs 20, 47), and in shape, from perfectly globular (*T. oncognatha* sp. nov.) (Fig. 15I) to oval (e.g., *T. bogotensis*, *T. mandibulata*, *T. nitens*) (Castanheira et al. 2019, figs 2H, I, 12I, 15K, L) or even kidney-like (*T. elongata*, *T. vermiformis*) (Castanheira et al. 2019, figs 6H, 18I). Colour of specimens is variable, encompassing reddish, yellowish, brown and orange hues depending on time spent in alcohol (e.g., Figs 1A, B, 6A, 11A). Old specimens, such as the female *T. paraguayensis*, usually lose completely their original colour, presenting a light-yellow bleached tone (Castanheira and Baptista 2021b, fig. 4A).

Distribution. Cosmopolitan.

Key for the species of *Tetragnatha* of Argentina and Brazil

Males

1 Tegulum slanted (Castanheira et al. 2019, figs 5H–K, 7C; Castanheira and Baptista 2021b, figs 63, 64, 78) 2
– Tegulum not slanted (e.g., Fig. 2H) 3
2 Eyes with ALE and PLE not touching each other; chelicerae with no carved 'a', reduced Gu and straight 'sl'; pedipalps with very short tibia, tegulum extremely slanted, filiform conductor and paracymbium triangular (Castanheira and Baptista 2021a, figs 56, 59, 60, 62, 63–65, 74, 78–80) ..... *T. jaculator*
– Eyes with ALE and PLE touching; chelicerae with 'a' long and carved on its inner margin, Gu long, pointed and distalward projected, and 'sl' short, triangular and basalward projected; pedipalps with tibia extremely elongated, tegulum slightly slanted, conductor ribbon-like with triple pleats and paracymbium much longer than wide (Castanheira et al. 2019, figs 5A, D, E, G–I, K, 7A, C, D, F) ..... *T. elongata*
3 Abdomen elongated, slender, without a pointed projection overhanging spinnerets (e.g., Figs 2C, 6C, 7C) 5
– Abdomen with such projection (e.g., Fig. 10B, C) 4
4 Eyes with ALE and PLE touching each other; chelicerae much elongated with thin and very elongated 'a' and 't'; 'T' absent and reduced GI; palps with elongated tibia (Fig. 10A, D–J) ..... *T. didorata* sp. nov.
– Eyes with ALE and PLE not touching; chelicerae short with thick and short 'a'; 't' absent; 'sl' reduced and basalward projected; 'T' thick and elongated; GI long; palps with very short tibia (Castanheira and Baptista 2021b, figs A, D–J) ..... *T. caudata*
5 Abdomen, very thin and slender, normally with dark lateral patches (e.g., Castanheira and Baptista 2020, fig. 1A, B, 9A, B, 12A) 6
– Abdomen larger and bulkier, not slender, without black patches (e.g., Castanheira et al. 2019, figs 1A, B, 9A, B) 9
6 Pedipalps with embolus completely covered by the conductor, paracymbium elongated with translucent lobe occupying at least 50% of its width (Castanheira and Baptista 2020, figs 1H–J, 3D–G, 4G–I, 6C–F, 9H–J) 7
– Pedipalps with embolus filiform and not completely wrapped by the conductor, paracymbium very short and triangular, with rounded notch and narrow translucent lobe (Castanheira and Baptista 2020, figs 12G–I, 14E–G) ..... *T. tenuissima*
7 Chelicerae with 'a' short, Gu and GI reduced and rounded, 't' and 'T' absent and fangs with short inner cusp; pedipalps with paracymbium almost as longer as wide, subquadrate, with straight notch (Castanheira and Baptista 2020, figs 4C–I, 6A–F) ..... *T. renatoi*
– Chelicerae with 'a' elongated and curved, 'T' and GI pointed and long, fangs without cusps; pedipalps with paracymbium longer than wide not subquarate with pointed notch (Castanheira and Baptista 2020, figs 1D–J, 3A, B, D–G, 9D–J) 8
8 Chelicerae with a clear swollen behind 'a', 't' and Gu absent, 'sl' reduced and pointed, 'T' with large basis, L2 curved with large basis, fangs closing between teeth rows; pedipalps with conductor tip very enlarged and paracymbium with pointed notch (Castanheira and Baptista 2020, figs 1D–J, 3A, B, D–G) ..... *T. megalocera*
– Chelicerae with 't' small and rounded, Gu elongated, pointed and slightly basalward projected, 'sl' absent, 'T' very thin and pointed, GI elongated, L2 small and fangs closing above 'T'; pedipalps with embolus with curved tip, opening below the transparent conductor tip, covering the embolus as a cap, paracymbium with notch rounded and undivided (Castanheira and Baptista 2020, figs 9D–J) ..... *T. chauliodus*
9 Chelicerae with elongated 'T' (e.g., Figs 2D–F, 3A, B) 10
– Chelicerae without 'T' (e.g., Castanheira et al. 2019, figs 1E–G, 11D–F) 17
10 Pedipalps with paracymbium bearing elongated finger-like projection and slanted notch (Castanheira and Baptista 2021a, figs 11, 25, 27) ..... *T. guatemalensis*
– Pedipalps with paracymbium either excavated or not, without finger-like projection (e.g., Figs 2J, 3G) 11
11 Abdomen thin, elongated; chelicerae very long, Gu long, thin and slanted, 'sl' absent, 'T' very elongated with a narrow basis, distalward projected; pedipalps with tip of conductor and embolus hook-like (Figs 2A–E, I, 3A, D–F) 12
– Abdomen short to median-sized; chelicerae short, Gu reduced, 'sl' present or absent, 'T' not elongated with larger basis; pedipalps with conductor wrapping the embolus tip or curved bird-head shaped (e.g., Figs 7A–E, 8A, C, D, 14A–E, I, 16A, E) 14
12 Chelicerae with 't' present, Gu with almost the same length as 'T', GI and L2 thinner with narrow bases; pedipalps with paracymbium with rounded uncarved notch and very reduced translucent lobe (Castanheira et al. 2019, figs 8A–F, J, 10A, E) ..... *T. keyserlingi*
– Chelicerae with 't' absent, Gu median much shorter than 'T', GI and L2 with larger basis; pedipalps with paracymbium bearing carved notch and conspicuous translucent lobe (Figs 2D–F, J, 3A, B, G; Cargnelutti et al. 2022, figs 2D–F, J, 3A, B, G) 13
13 Chelicerae with GI and L2 almost straight and having large bases; pedipalps with thinner tibia, conductor tip curved and very pointed, paracymbium with translucent lobe ending on the same level of paracymbium proper, forming a carved notch; epiandrous field with narrow median division, with 26 spigots (Figs 2F–J, 3B, D–H) ..... *T. cladognatha*
– Chelicerae with GI and L2 not straight, GI with wide basis, L2 rounded with narrow basis; pedipalps with thicker tibia, conductor tip curved, large and moderately pointed, paracymbium with translucent lobe reaching over the paracymbium

proper, forming a pronounced carved notch; epiandrous field with wide median division, with 18 spigots (Cargnelutti et al. 2022, figs 2F–J, J, 3E–H) ..... *T. argentinensis*

14 Chelicerae with Gu located on fang groove and 'sl' present; pedipalps with conductor very elongated, ending in a thin basalward projected bird-head/ribbon shaped tip, paracymbium wide, not slanted, with rounded notch (Castanheira and Baptista 2021a, figs 32, 33, 36–38, 48, 52–54) ..... *T. laboriosa*

– Chelicerae with Gu not located on fang groove, 'sl' absent; pedipalps with conductor ending in rounded tip, paracymbium slightly slanted (e.g., Figs 7D, E, H–J, 8A, C–E, 14D, E, H–J) 15

15 Eyes with ALE and PLE not touching; chelicerae without cheliceral bulge and lower crest, 'a' curved, Gu and 'T' slightly apart from the upper teeth row, AXl present; pedipalps with paracymbium very narrow, with notch rounded and translucent lobe reduced (Castanheira et al. 2019, figs 17A, D–G, J, 19A, E) ..... *T. vermiformis*

– Eyes with ALE and PLE touching; chelicerae with a conspicuous bulge on upper row and a lower crest, 'a' straight and slanted, Gu reduced, projected distalward, 'T' slightly located on teeth groove, AXl absent; pedipalps with wide paracymbium, with notch slightly curved and translucent lobe broad (Figs 7A, D–G, J, 8A, B, E, 14A, D–G, J, 16A, G) 16

16 Chelicerae with rounded and larger cheliceral bulge (CB), 'a' with reduced carving on its tip, AXu very reduced, lower crest going beyond L2, midway from reaching L3; pedipalps with embolus opening on ventral side of conductor and paracymbium with notch with large and slightly curved rounded tip (Figs 14D–J, 16A, B, E–G) ..... *T. oncognatha* sp. nov.

– Chelicerae with smoother CB, 'a' with conspicuous dent on its lower size, AXu absent, lower crest very large, rounded and not reaching L2; pedipalps with embolus opening on dorsal side of conductor, paracymbium with notch curved and not very large (Figs 7D–J, 8A–E) ..... *T. cristata* sp. nov.

17 Chelicerae with 'a' pointed, not carved, 't' and AXu absent, Gu with very large basis, placed on fang groove; pedipalps with conductor very flattened, winglet-shaped (Castanheira et al. 2019, figs 11D–F, G–J, 13A, E, F) ..... *T. mandibulata*

– Chelicerae with 'a' carved, 't' and AXu very elongated and pointed, Gu small, apart from fang groove; pedipalps with conductor very large and rounded (Castanheira et al. 2019, figs 1C, E, F, H–J, 3A, B, E, 14C, D, F–H, 16A, D, E, 20A, E) 18

18 Chelicerae with AXu with large basis, slanted, 't' thick, slanted, Gu distalward projected, longer than U2; pedipalps with median sized tibia, conductor with its tip large, rounded, completely enfolding embolus tip, paracymbium longer, overreaching distal margin of tegulum, translucent lobe occupying around 40% of its maximum width, and notch formed by tip of paracymbium proper clearly longer than tip of lobe (Castanheira et al. 2019, figs, 1C, E, F, I–K, 3A, B, D, E) ..... *T. bogotensis*

– Chelicerae with AXu with thin basis, very slanted, 't' sickle-like, elongated, Gu basalward projected, smaller than U2; Pedipalps with long tibia, conductor with its tip curved and flattened, hiding embolus tip, paracymbium shorter, not reaching the distal margin of tegulum, and very wide, with translucent lobe occupying more than 70% of its maximum width, and notch formed by tip of paracymbium proper placed about the same level of the tip of lobe (Castanheira et al. 2019, figs, 14C, D, G–J, 16A, D, E) ..... *T. nitens*

Females

1 Abdomen elongated, slender, with a long tail-shaped pointed projection overhanging spinnerets (Castanheira and Baptista 2021b, figs 2B, 4A, B) 2

– Abdomen without such projection 3

2 Short projection overhanging spinnerets with around ¼ of the abdomen length; chelicerae with L2 a bit larger than L3 (Castanheira and Baptista 2021b, fig. 2A, E, F, 3D) ..... *T. caudata*

– Elongated projection overhanging spinnerets with around ½ of the abdomen length; chelicerae with L3 with very wide basis and massive size, much larger than L2, and slanted (Castanheira and Baptista 2021b, fig. 4A–E) *T. paraguayensis*

3 Genital fold around as long as wide (e.g., Fig. 15H) 4

– Genital fold longer than wide (e.g., Fig. 18G) 12

4 Internal genitalia without a central membranous sac (CS) (Castanheira et al. 2019, fig. 18I; Castanheira and Baptista 2021a, fig. 47) 5

– Internal genitalia with central membranous sac (CS) (see e.g., Castanheira and Baptista 2020, figs 5I, 13H) 6

5 Chelicerae with Gu slightly displaced from fang groove, GI a little basalward projected; spermathecae kidney-like, located on edge of plate (Castanheira et al. 2019, figs 18D–F, I, 19B) ..... *T. vermiformis*

– Chelicerae with Gu located on edge of fang groove, GI distalward projected; spermathecae with both lobes long, arched, with rounded tips of about the same size (Castanheira and Baptista 2021a, figs 42–44, 47, 50, 51) ..... *T. laboriosa*

6 Central membranous sac (CS) slender (Castanheira and Baptista 2020, fig. 15H; Castanheira and Baptista 2021a, fig. 73) 7

– CS rounded (e.g., Castanheira and Baptista 2020, figs 2I, 5I) 8

7 Abdomen slender and very thin, more than 7× longer than wide; chelicerae very elongated, with clear upper crest, pointed outer cusp and GI slightly curved downwards; genital fold with straight posterior rim; spermathecae cylindrical, much longer than wide (Castanheira and Baptista 2020, figs 13A–H, 14C, D) ..... *T. tenuissima*

– Abdomen less than 4× longer than wide; chelicerae short and laterally bulged, with no crests or cusps; genital fold with curved posterior rim; spermathecae mushroom-shaped, wider than long (Castanheira and Baptista 2021a, figs 66–73, 76, 77) ..... *T. jaculator*

8 Central membranous sac poorly sclerotized and probably not functional (Castanheira et al. 2019, fig. 6H; Castanheira and Baptista 2020 fig. 2I) 9

– Central membranous sac very sclerotized (e.g., Castanheira et al. 2019, figs 12I, 15K, L) 10

9 Abdomen thin and very slender, more than 9× longer than wide; chelicerae with Gu reduced, slightly displaced from fang groove, L2 bulky, extremely elongated, distalward projected, fangs without outer cusp; genital fold with straight posterior rim, almost on the same level of book-lungs plate; four rounded spermathecae, two on each side of the plate (Castanheira and Baptista 2020, figs 2A–I, 3C, I)..... *T. megalocera*

– Abdomen very enlarged anteriorly, around 2.5× longer than wide; chelicerae with Gu thick, rounded, GI large, triangular, L2 small, rounded, fangs bearing a clear outer cusp; genital fold with small cylindrical posterior rim, not on the same level of book-lungs plate; two massive, curved spermathecae, formed of two large tubes ending in rounded tips (Castanheira et al. 2019, fig. 6H) ..... *T. elongata*

10 Four oval spermathecae, small central membranous sac (Castanheira and Baptista 2021a, fig. 20)..... *T. guatemalensis*

– Two massive spermathecae, large central membranous sac (e.g., Fig. 12I; Castanheira and Baptista 2020, fig. 5I)... 11

11 Abdomen with dark lateral line; chelicerae with L2 equidistant between GI and L3; genital fold with straight posterior rim; two massive rounded spermathecae, central membranous sac oval (Figs 15B, E, F, H, I, 16D) ..... *T. oncognatha* sp. nov.

– Abdomen with no lateral lines; chelicerae with L2 and L3 very close, almost adjoined; genital fold with rounded posterior rim; two large subquadrate spermathecae, central membranous sac perfectly rounded (Castanheira and Baptista 2020, fig. 5B, E, F, H, I) ..... *T. renatoi*

12 Chelicerae bearing fangs with large median cusps (MC) (Figs 1D–F, 3C; Castanheira and Baptista 2020, fig. 10E, F; Cargnelutti et al. 2022, figs 1D–F, 3C, D) 13

– Chelicerae without MC (e.g., Castanheira et al. 2019, fig. 9E)..... 15

13 Abdomen slender and bearing lateral dark patches; chelicerae with large median cusp facing lower teeth row, presence of basal cusp near fang basis; central membranous sac cylindrical, reaching over anterior tip of spermathecae (Zhu et al. 2003, fig. 59B, D, E, G; Castanheira and Baptista 2020, figs 10A, B, D–G)..... *T. chauliodus*

– Abdomen large and without dark patches; chelicerae with median cusp facing upper teeth row, without basal cusp; central membranous sac with enlarged head, reaching around middle level of spermathecae (Figs 1B–F, I, 3C, I; Cargnelutti et al. 2022, figs 1A–F, I, 3C, D) 14

14 Abdomen anteriorly enlarged; chelicerae without crests, Gu almost straight, L2 with large rounded basis, fang with semi-circular basal half bearing pointed inner cusp; genital fold with a strong concavity on posterior rim (Figs 1A, B, D–F, H, 3C)..... *T. cladognatha*

– Abdomen cylindrical, without apparent enlargement; chelicerae bearing clear upper crest, Gu distalward projected, L2 with a normal, not enlarged basis, fang without semi-circular basal half and without inner cusps; genital fold with a smooth concavity on posterior rim (Cargnelutti et al. 2022, figs 1A, D–F, H, 3C, D)..... *T. argentinensis*

15 Chelicerae with deep upper and lower crests; central membranous sac wide, thin and rounded, on top of extremely elongated stalk (Castanheira et al. 2019, figs 9D–F, I, 10B)..... *T. keyserlingi*

– Chelicerae without crests; central membranous sac cylindrical or oval, with small to median-sized stalk (e.g., Castanheira et al. 2019, figs 2C–E, H, I)..... 16

16 Abdomen with pointed posterior projection; chelicerae with outer and inner cusps; genital fold extremely elongated and slender; central membranous sac cylindrical (Fig. 18A–H)..... *T. pradoi* sp. nov.

– Abdomen without projection; chelicerae without cusps; genital fold not as elongated; central membranous sac rounded (e.g., Castanheira et al. 2019, figs 15A–L) 17

17 Chelicerae without conspicuous cheliceral bulges (CB) and reduced AXI (Castanheira et al. 2019, figs 15C–G, 16B) ..... *T. nitens*

– Chelicerae with CB and bearing elongated and pointed AXI (Castanheira et al. 2019, figs 2C–E, 3B, 12D–F, 13C, D).....18

18 Chelicerae with curved conspicuous cheliceral bulge, GI thin, straight and pointed, basal cusp (BC) not slanted; central membranous sac small on same level as basis of spermathecae (Castanheira et al. 2019, figs 2C–E, I, J, 3B)..... *T. bogotensis*

– Chelicerae with smooth cheliceral bulge, GI finger-like, slanted and distalward projected, basal cusp slanted; central membranous sac massive, rounded, larger than the spermathecae and reaching over their anterior end (Castanheira et al. 2019, figs 12D–G, I, 13C, D)..... *T. mandibulata*

Tetragnatha cladognatha Bertkau, 1880

Figs 1–5

Tetragnatha cladognatha Bertkau, 1880: 79, pl. 2, fig. 27 (♀)

Type-material. *Tetragnatha cladognatha*: Brazil: female, holotype, Rio de Janeiro, not located (presumed lost). Brazil, **Rio de Janeiro** • Neotype female herein designated, Rio de Janeiro, Parque Estadual da Pedra Branca, Camorim (Sede), 22°58'12.0"S, 043°26'16.4"W, 160 m, 09.i.2014, RLC Baptista leg. (UFRJ 1628).

Material examined. Argentina, **Misiones** • 1 female, Parque Provincial Uruzú, 1° Uruzú, 25°50′S, 54°08'W, 02.ii.1988, P. Goloboff and Szumik leg. (MACN-Ar 24553); • 2 males, 4 females, 3 juveniles, Departamento Cainguás, Parque Provincial Salto Encantado, Arroyo Cuña-Pirú, 27°07'S, 54°48'W, 12.i.2005, C Grismado, L Lopardo, L Piacentini, A Quaglino and G Rubio leg. (MACN-Ar 31757); • 1 male, 1 female, 1 juvenile, same data (MACN-Ar 31763); • 1 male, Saltos del Uruguay, 10 Km N Puerto Libertad, 25°55'08.0"S, 54°35'59.7"W, 23–25.ii.1997, M Ramírez leg. (MACN-Ar 24661); • 1 female, same data, (MACN-Ar 24645); • 1 male, 8 females, 6 juveniles, Santa Maria, 27°56'05.6"S, 55°24'54.9"W, x.1956, Viana leg. (MACN-Ar 24423); • 1 male, 2 females, 1 juvenile, Cataratas del Iguazú, 25°41'28.1"S, 54°26'43.6"W, xi.1954, BC Schiapelli leg. (MACN-Ar 39613); BRAZIL, **Mato Grosso do Sul** • 1 male, Jaraguari, Furnas de Dionísio, 20°09'21.5"S, 54°43'34.4"W, 14.xi.2015, D Araújo leg. (IBSP 167038); **Minas Gerais** • 3 males, 4 females, Alto Caparaó, Parque Nacional do Caparaó, 20°05'S, 41°09'W, 01–07.v.2002, Equipe Biota leg. (IBSP 220017); • 1 female, Rio Preto, 22°05'21.1"S, 43°50'11.1"W, 14–20.v.2002, RLC Baptista et al. leg. (MNRJ 1577); • 2 females, same data, (MNRJ 1586); **Paraná** • 2 females, São José dos Pinhais, 25°36'01.40"S, 049°11'24.66"W, 08.i.2002, A Chagas-Jr. leg. (MNRJ 03744); • 1 female, same locality, 15.xi.2015, AC Domahovski leg. (MCTP 39130); • 1 male, same locality, 25°36'12.65"S, 49°11'33.58"W, x.2015, AC Domahovski leg. (MCTP 39055); **Rio de Janeiro** • 1 male, 2 females, 2 juveniles, Cachoeiras de Macacu, Reserva Ecológica de Guapiaçu (REGUA), river nearby accommodation, 22°27'12.4"S, 42°46'21.1"W, RLC Baptista leg. (UFRJ 1503); • 1 female, same locality, trilha cinza, 29.viii.2019, AA Alves leg. (UFRJ 1620); • 1 male, 3 females, Guapimirim, 22°35'25.1"S, 43°06'15.7"W (MNRJ 1572); • 1 female, same locality, ii.1996 (MNRJ 1570); • 3 males, 2 females, 1 juvenile, Itatiaia, Cachoeira Véu da Noiva, 1250 m, 22°25'35.6"S, 44°37'12.6"W, 06.i–03.ii.2016, M Monné leg. (MNRJ 4260); • 1 male, Macaé, Sana, tributário 2 ordem do Rio Sana, 313 m, 22°19'39.6"S, 42°11'11.4"W, 16.ii.2009, Entomologia UFRJ leg. (UFRJ 0378); • 1 male, 1 female, Magé, Piabetá, 22°36'21.7"S, 43°10'36.8"W, xi.1986 (MNRJ 1574); • 1 male, Nova Friburgo: Macaé de cima, 956 m, 22°21'11.1"S, 42°24'40.5"W, 01.xii.2008, BHL Sampaio and APM Santos leg. (UFRJ 0071); • 1 female, same locality, Rio das Flores, 22°24'06.7"S, 42°29'19.4"W, BHL Sampaio leg. (UFRJ 0073); • 1 female, Nova Iguaçu, Parque Municipal de Nova Iguaçu (PMNI), 22°46'44.6"S, 43°27'31.8"W, 01.v.2004, BHL Sampaio leg. (MNRJ 07445); • 1 male, 2 females, same locality, 28.v.2004, BHL Sampaio leg. (MNRJ 07449); • 1 female, same locality, 10.vii.2004, BHL Sampaio leg. (MNRJ 07446); • 2 females, same locality, 31.vii.2004, C Lima leg. (MNRJ 07444); • 1 male, 1 female, same locality, 26.xi.2004, BHL Sampaio leg. (MNRJ 07447); • 1 female, Petrópolis, 22°29'01.5"S 43°15'10.8"W, Mello-Leitão leg. (MNRJ 60003); • 1 female, Pinheiral, Pinheiro, 22°30'24.3"S, 44°01'22.2"W, Mello-Leitão leg. (MNRJ 60009); • 1 male, Resende, Vila da Fumaça, Estrada Falcão-Fumaça, 22°17'57.1"S, 44°13'07.9"W, 10.xi.2016, LBN Coelho leg. (UFRJ 1366); • 1 male, 1 juvenile, Rio de Janeiro, Parque Estadual da Pedra Branca, Camorim (Sede), 22°58'12.0"S, 043°26'16.4"W, 160 m, 15.ix.2013, RLC Baptista leg. (UFRJ 1622); • 1 female, 1 juvenile, same data (UFRJ 1623); • 1 female, same data (UFRJ 1624); • 1 female same data but RLC Baptista and PdS Castanheira leg. (UFRJ 1625); • 3 males, 1 female, 7 juveniles, same locality, 09.i.2014, RLC Baptista leg. (UFRJ 1626); • 5 females, 4 juveniles, same data (UFRJ 1629); • 1 female, same locality, 07.iv.2014 (UFRJ 1627); • 1 male, 1 female, 1 juvenile, same locality, Camorim (Véu da Noiva); 04.x.2017, ALD Ferreira leg. (UFRJ 1483); 1 male, same data (UFRJ 1523); • 1 female, same data (UFRJ 1524); • 1 female, same data (UFRJ 1525); • 1 male, Sepetiba, 22°58'06.9"S, 43°42'46.8"W, iv.1994, EH Wienskoski leg. (MNRJ 1585); • 1 male, 4 females, 1 juvenile, Teresópolis, Serra do Subaio, 22°27'10.8"S, 42°56'48.8"W, 20–22.iv.1995, RLC Baptista and M Landim leg. (MNRJ 1568); • 3 females, 2 juveniles, Visconde de Mauá: Alto Penedo (Rio das Pedras), 22°23'03.1"S, 44°37'32.5"W, i.2006, EH Wienskoski leg. (MNRJ 05041); **Rio Grande do Sul**: • 1 female, Eldorado do Sul, 30°06'59.3"S, 51°40'28.0"W, 28.iii.1993, M Silveira leg. (MCTP 43347); • 1 female, Novos Cabrais, Parque Witeck, 29°46'59.1"S, 52°58'26.7"W, 18.ii.2008, RG Buss leg. (MCTP 28307); • 1 male, 2 females, São Francisco de Paula, Potreiro Velho, 29°23'56.1"S, 50°16'12.6"W, 16–17.iii.2001, AA Lise leg. (MCTP 14349); • 5 males, Rio Uruguai, 29°27'34.6"S, 56°43'54.2"W, 02.ix.2010, RC Francisco leg. (MCTP 43349); **Santa Catarina** • 1 male, Nova Teutônia, 27°09'40.4"S, 52°25'31.8"W, 13–15.x.2006, ELC Silva et al. leg. (MCTP 28703); **São Paulo** • 3 females, Botucatu, 22°56'15.3"S, 48°23'32.6"W, ii.2002, EH Wienskoski leg. (MZUSP 62396); • 1 male, 1 female, Cachoeira da Marta, 22°55'55.0"S, 48°24'19.7"W, 10.i.2002, EH Wienskoski leg. (MZUSP 62429); • 1 male, 1 female, same locality, 10.iii.2002, EH Wienskoski leg. (MZUSP 62036); • 1 male, 1 female, same locality, i.2003, EH Wienskoski leg. (MZUSP 62430); • 1 male, Fazenda Paulina, 22°56'15.3"S, 48°23'32.6"W, i.2002 (MZUSP 62395); • 1 male, 2 females, Cabreúva, Sítio do Sol, 23°18'54.4"S 47°05'48.4"W, 05.iv.2009, AB Ri-

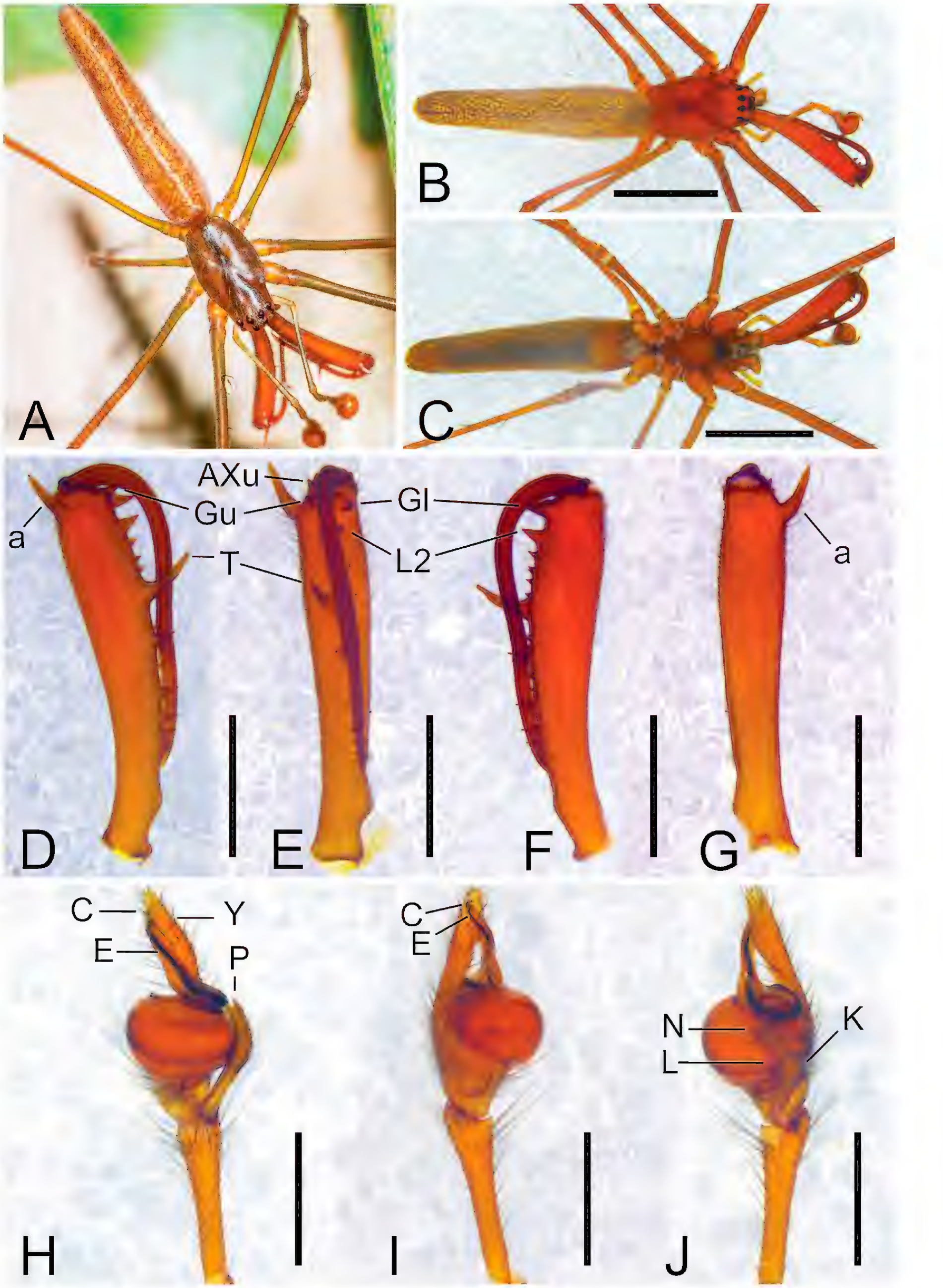


Figure 2. *Tetragnatha cladognatha* male. **A.** Live specimen, dorsal habitus (not collected); **B.** Dorsal habitus (UFRJ 1483); **C.** Ventral habitus (UFRJ 1483); **D–G.** Left chelicera (UFRJ 1483); **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–J.** Left pedipalp (UFRJ 1483); **H.** Mesal view; **I.** Dorsal view; **J.** Ventral view (paracymbium). Scale bars: 2 mm (**A–C**); 0.2 mm (**D–J**). Photo of live specimen: Ederson Oliveira.

beiro leg. (IBSP 145209); • 2 males, São José do Barreiro, Parque Nacional Serra da Bocaina, Fazenda do Bonito, 22°43'25.3"S 44°32'21.0"W, Vulcano leg. (MZUSP 14746); • 1 male, same locality, Córrego do Boqueirão, 19.xii.2010, Entomologia UFRJ leg. (UFRJ 0550); • 1 male, 1 female, Rio Claro, Lidice, RPPN Fazenda Sambaíba, 22°50'55"S, 44°13'03"W, 23.iv.2012, C Bragagnolo et al. leg. (IBSP 213057); • 11 males, 26 females, Mogi das Cruzes, Manoel Ferreira, Biritiba-Uçu, 23°38'20.6"S, 46°07'33.1"W, v.2001, EK Kashimata and R Martins leg. (IBSP 56320).

Diagnosis. Males and females most resemble *T. argentinensis* (Cargnelutti et al. 2022). Females can be distinguished by the following differences in the chelicerae: fang almost sickle-shaped, with a semicircular basal half and an abruptly slanted and straighter distal half basally to the inner cusp; Gu more sclerotized with larger basis; Gl bulkier and closer to fang basis; L2 larger with wider, bulged, rounded basis, median cusp (MC) more distally placed and presence of conspicuous inner cusp (Figs 1D–F, 3C). Males of *T. cladognatha* differ from *T. argentinensis* by slightly shorter and less pointed 'T'; longer and bulkier Gu, Gl and L2 (Figs 2D–F, 3A, B); Gl and L2 straight with much larger basis (Figs 2E, F, 3B); upper teeth row with lesser teeth and lower row with more teeth (Figs 2D, F, 3A, B); narrower pedipalp tibia (Figs 2H–J, 3D); narrower, thinner and more pointed conductor tip (Figs 2I, 3F) and epiandrous field almost straight, with narrower median division, with more spigots (26 vs. 18) (Fig. 3H; Cargnelutti et al. 2022, fig. 3H). Additionally, males are also similar to *T. keyserlingi* with *T. cladognatha* differing from it due to Gu shorter, with larger basis, 'T' longer and more projected, Gl and L2 bulky and more elongated, with much larger bases (Figs 2D–F, 3A, B). Pedipalps of *T. cladognatha* are identified by the less protruding hook-like conductor and paracymbium with divided notch and wider translucent lobe (Figs 2H–J, 3D–G).

Description. Female (based on neotype UFRJ 1628): Carapace elongated, oval and reddish brown, slightly elevated anteriorly (Fig. 1A, B). Fovea reddish brown, slightly darker than carapace, with dark borders (Fig. 1A, B). Labium wider than long and dark brown (Fig. 1C). Sternum oval and light brown (Fig. 1C). Eyes with procurved parallel rows, and evenly separated, AME and PME separated by its length, ALE and PLE almost touching (Fig. 1A, B). Legs reddish brown, with few spines on femora (Fig. 1B, C). Chelicera paturon thick, around 4× longer than wide and about 1.6× longer than carapace, well curved outwards, around 50° from body median line (Figs 1B, D–G, 3C). AXu absent (Figs 1D, E, 3C). Upper row with nine teeth distalward projected (Figs 1D, E, 3C): Gu almost straight, pointed, almost as long as U3, bearing bulky and wide basis and apart from U2 by an extremely large gap; U2 small and pointed, almost as long as U4–U7; U3–U9 decreasing in size and pointed. AXl absent (Fig. 1E, F). Lower row with 20 teeth distalward projected (Fig. 1E, F): Gl bulky and very sclerotized and located on fang furrow; L2 elongated, pointed, with rounded bulging basis and apart from Gl by a small gap; L3–L12 decreasing in size. Cheliceral fang very elongated, thick, with pointed and large median cusp (MC) on its first third, facing upper row and becoming slanted and projected inward to its tip from small pointed inner cusp (IC) at around half of its length (Figs 1D, E, 3C). Abdomen around 4.1× longer than carapace, cylindrical and anteriorly enlarged, dorsally greyish and completely covered by guanine crystals (Fig. 1B). Venter colour as dorsum, with a median brown stripe from genital fold towards spinnerets (Fig. 1C). Genital fold elevated, 1.4× wider than long, with parallel borders and ending in concave and wide excavated tip (Fig. 1H). Internal genitalia formed by two oval spermathecae, more sclerotized on the lateral border, and connected to a wide *uterus externus* and an almost cylindrical central membranous sac (Figs 1I, 3I).

Measurements. Total length 12.5. Carapace 4.4 long, 2.3 wide. Abdomen 10.0 long, 2.9 wide. Left chelicera 2.9 long, 0.5 wide. Leg formula I–IV–II–III. Leg I: femur 13.3, patella 1.8, tibia 11.5, metatarsus 11.5 and tarsus 2.3. Leg II: patella + tibia 8.6. Leg III: patella + tibia 3.4. Leg IV: patella + tibia 7.3.

Male (based on UFRJ 1483): Carapace, fovea, eyes, legs, legs and sternum similar to female (Figs 2A–C). Chelicerae paturon with similar colour as female, around 2.2× longer than wide, about 1.15× longer than carapace, slightly curved outwards around 35° from body median line (Figs 2B, D–G, 3A, B). 'a' elongated, thin, pointed, and distally projected, located on edge of paturon close to fang groove (Figs 2D, E, G, 3A). AXu short with large basis (Figs 2D, E, 3A), 't' absent (Figs 2D, E, 3A). Upper row with eight teeth distalward projected (Figs 2D, E, 3A): Gu with large basis, thick and pointed, located on fang groove; 'sl' absent; 'T' very very elongated, thin, and pointed, with wide basis, slightly projecting upward and 'rsu' with six straight pointed teeth decreasing in size, with large gap between 'T'–U3 and U3–U4. AXl absent (Figs 2E, F, 3B). Lower row with 17 teeth and two additional ones, one besides U4 and another besides U6, all distalward projected (Figs 2E, F, 3B): Gl and L2 very similar, thick, bulky with large bases, apart by small gap, Gl slightly bulkier with larger basis; L3–L17 and two additional teeth with almost the same size, all very short, triangular and pointed. Cheliceral fang elongated, slightly wavy from midway and closing between teeth rows (Figs 2D–F, 3A, B). Abdomen of similar colour as female, but much slimmer (Fig. 2B, C). Epiandrous field much wider than high and curved, with a narrow division, and bearing thirteen spigots on each side (Fig. 3H). Pedipalps with median-sized cymbium, around the same size as the rounded, narrow tibia (Figs 2H–J, 3D); tegulum about 1.5 wider than long, spherical and inflated (Figs 2H, 3D, E); conductor larger mid-way, ribbon-like, and twisted, with thick edges, enfolding the embolus as a pouch, tapering towards its hook-like tip (Figs 2H, I, 3D–F); embolus

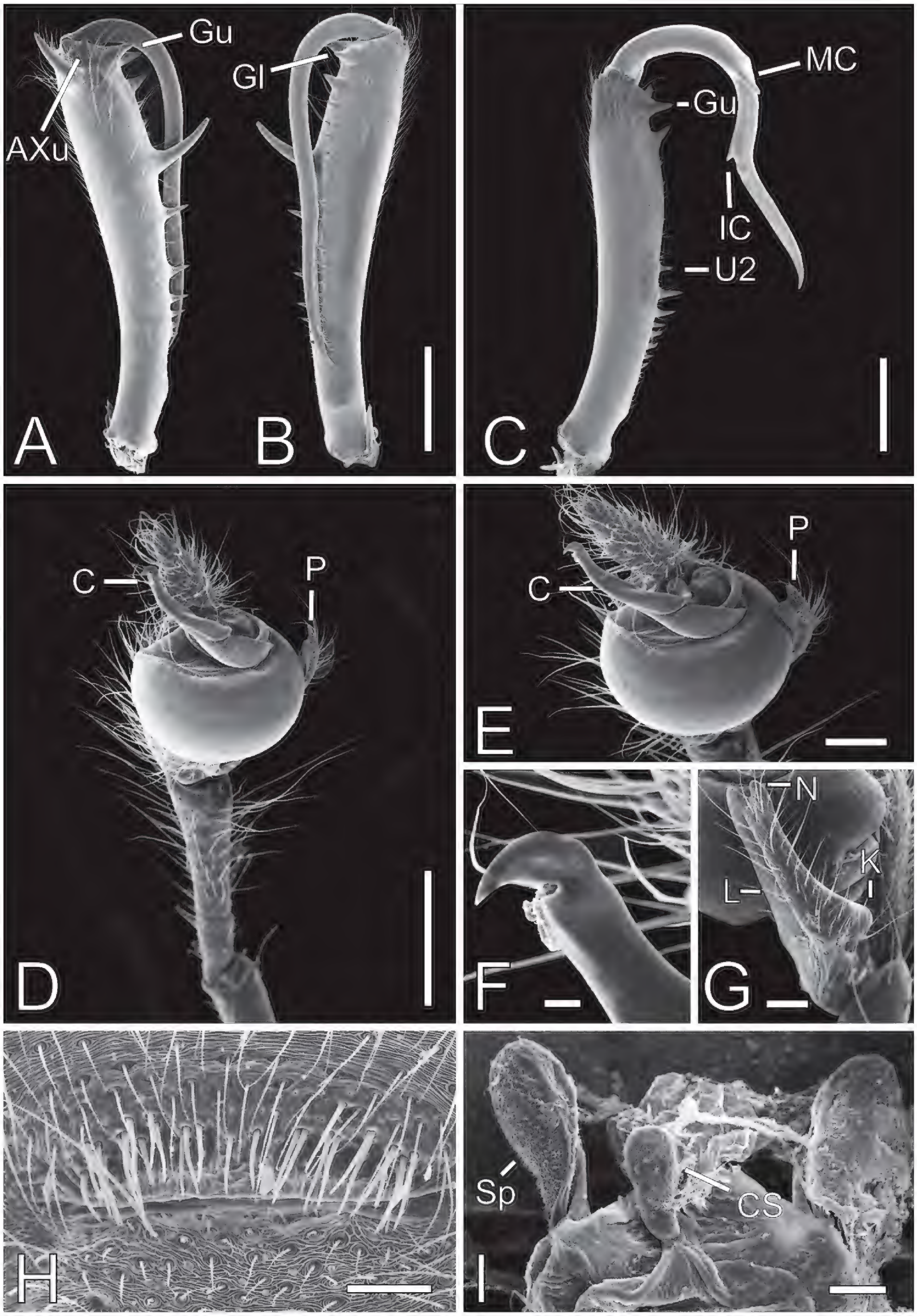


Figure 3. *Tetragnatha cladognatha* SEM photos. **A, B.** Male left chelicera (UFRJ 1483); **A.** Upper view; **B.** Lower view; **C.** Female left chelicera upper view (UFRJ 1629); **D–G.** Left male pedipalp (UFRJ 1523); **D.** Mesal view; **E.** Bulb detail, distal-mesal view; **F.** Tip of conductor and embolus opening detail, dorsal view; **G.** Paracymbium detail, ventral view; **H.** Epiandrous field detail, ventral view (UFRJ 1523); **I.** Internal genitalia, dorsal view (UFRJ 1524). Scale bars: 0.5 mm (**A–D**); 0.2 mm (**E**); 0.02 mm (**F**); 0.1 mm (**G, I**); 0.05 mm (**H**).

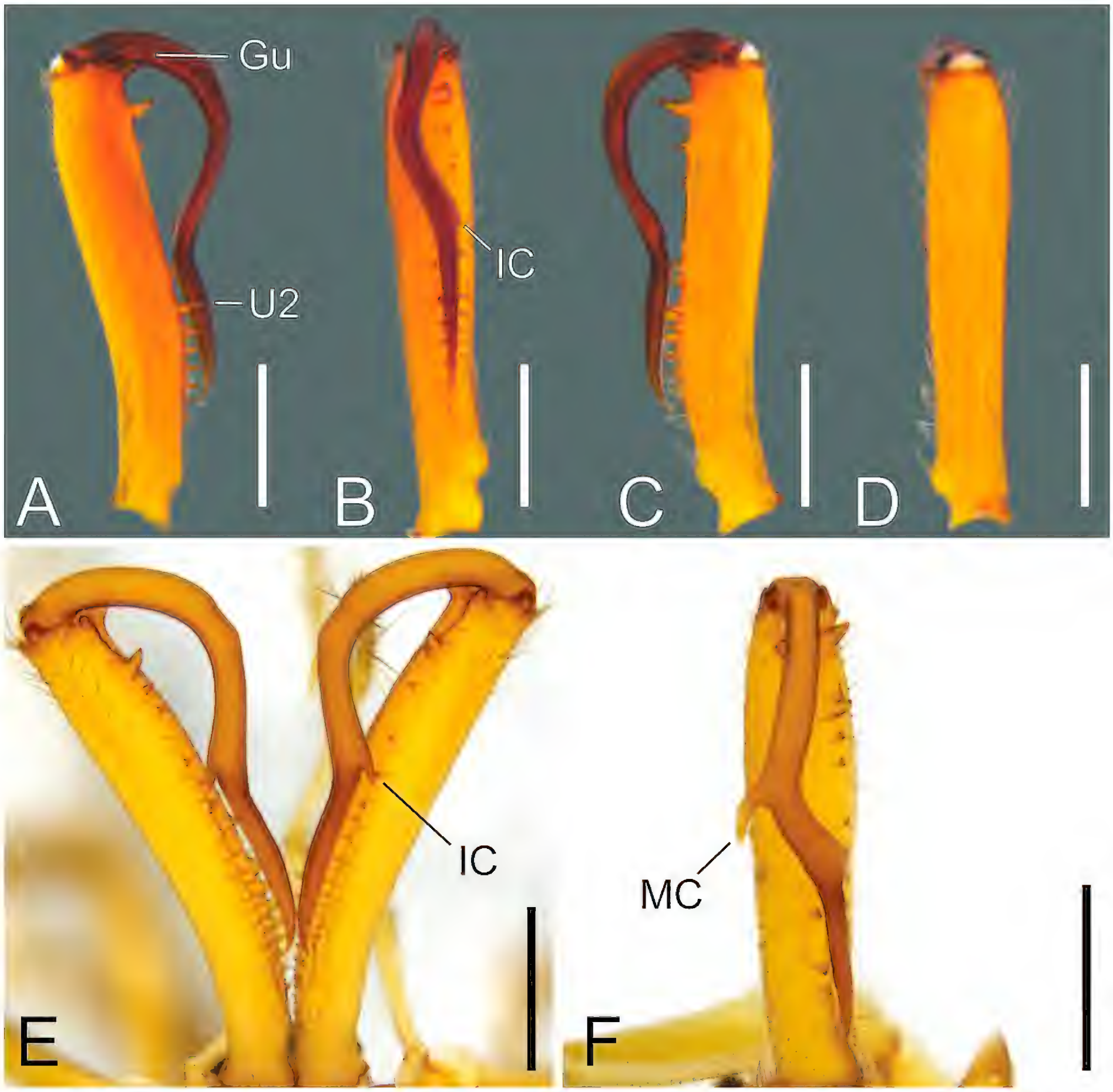


Figure 4. *Tetragnatha cladognatha* female, variation. **A–D.** Left chelicera without MC (IBSP 220017); **A.** Upper view; **B.** Inner view; **C.** Lower view; **D.** Outer view; **E–F.** Chelicerae fangs with longer area from basis to MC and shorter and more slanted area between MC and IC (MZUSP 62396); **E.** Both chelicerae ventral view; **F.** Left chelicera inner view. Scale bars: 1 mm.

thick, heavily sclerotized, S-shaped from mid-way, originating near cymbium at middle portion of bulb and opening from below conductor on a curved tip (Figs 2H, I, 3D–F); paracymbium 3.1× longer than wide, boomerang-shaped, slanted, and tapering towards its excavated notch at apex, with translucent lobe occupying little less than 50% of paracymbium length and reaching both its basis and apex, narrow and medially placed, and knob not projected and elbow-like (Figs 2J, 3G).

Measurements. Total length 6.40. Carapace 2.0 long, 1.2 wide. Abdomen 4.5 long, 1.0 wide. Left chelicera 2.6 long, 0.5 wide. Leg formula I–IV–II–III. Leg I: femur 7.4, patella 0.8, tibia 7.8, metatarsus 8.9 and tarsus 1.2. Leg II: patella + tibia 5.1. Leg III: patella + tibia 1.9. Leg IV: patella + tibia 4.5.

Variation. Females (n = 8): total length, 9.24 – 12.50; males (n = 6): total length, 6.4 – 9.9. Two different variations are noticeable in the median cusp of some specimens of *T. cladognatha*. The median cusp is absent in specimens collected in the highlands in Minas Gerais state (IBSP 220017) (Fig. 4A–D), while it is in a different position in the specimens from Botucatu (MZUSP 62036, MZUSP 62396), in comparison to the neotype herein described, more basally located and apart from the inner cusp by a straight slanted portion of the fang (Fig. 4E, F). These variations on the cheliceral median cusp may corroborate Levi's observation (1981) on intraspecific chelicerae variations, but they may also represent small, isolated populations on the verge of speciation.

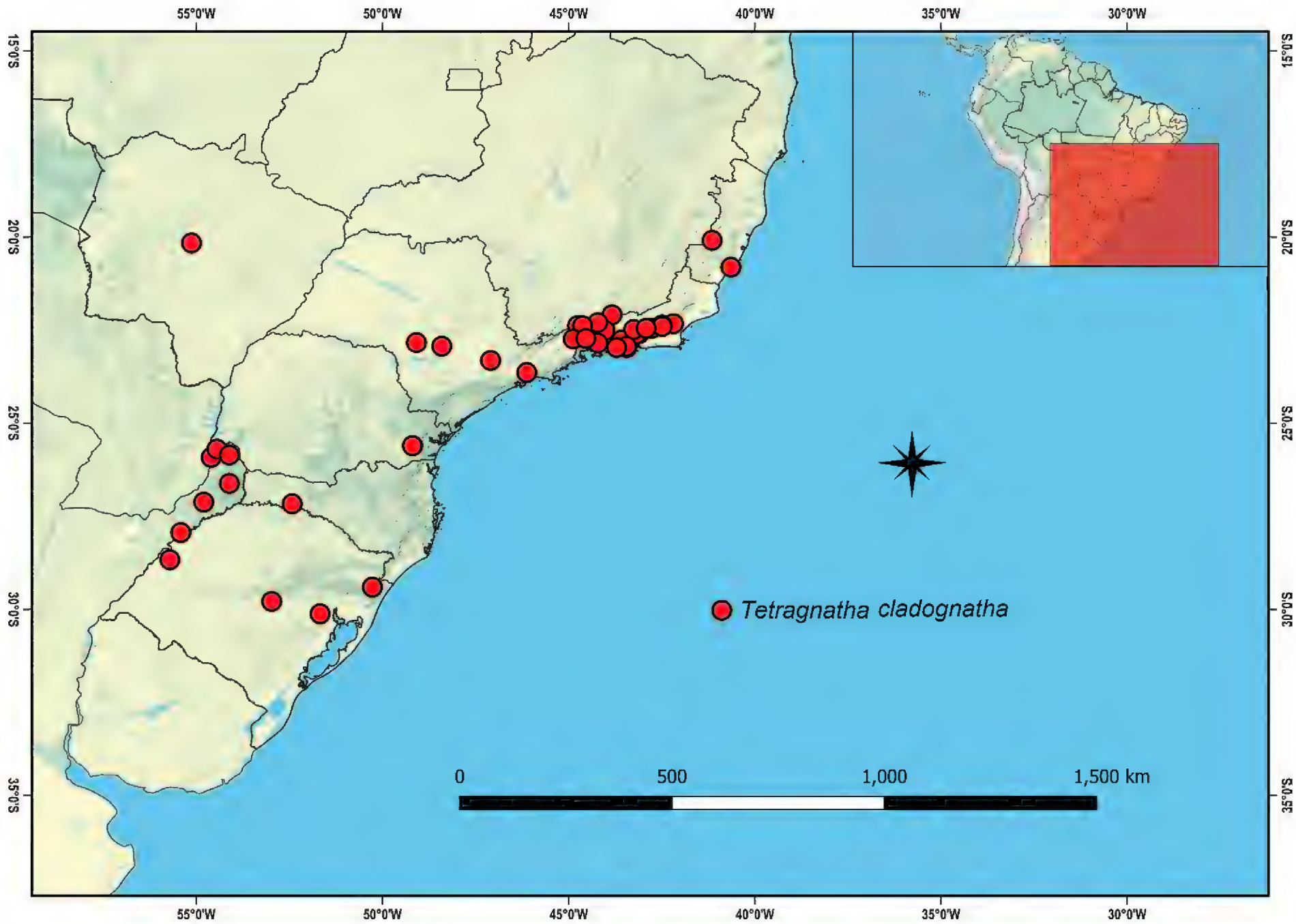


Figure 5. Distribution of *T. cladognatha*.

Remarks. The holotype female of *T. cladognatha* from Rio de Janeiro city is considered presumed lost as all Bertkau's spider types are, because none of them have ever been found in European collections. Considering that the distribution of *T. cladognatha* and *T. argentinensis* overlap in Brazil, with specimens of both species in Rio de Janeiro state (the type-locality of *T. cladognatha*), we consider the designation of a neotype necessary to clarify the taxonomic status of this species and therefore avoid possible misidentifications with *T. argentinensis*. Even though the original illustrations depicting the median cusp (Bertkau 1880, figs 27, 27a) help to identify the species, the precise identification of *T. cladognatha* was only possible after the examination of a large number of specimens from its type-locality, where it is much more commonly collected than *T. argentinensis*.

Life history and habitat preferences. Mature males and females of *T. cladognatha* were collected in all months except June, but with much fewer specimens in the winter (also July and August). There seems to occur some plasticity in the life cycle of this species, despite a large percentage of mature specimens collected during late summer/early spring. Original labels of the specimens and our personal observations in the field suggest an affinity of this species with water courses, as it was hand collected along rivers as informed by the original labels, "manually collected in Camorim river" or in insect traps "malaise traps" and "light traps".

Distribution. From Central (Mato Grosso do Sul state) and south-east (Espírito Santo state) Brazil to north-east Argentina (Misiones province) (Fig. 5).

Tetragnatha amazonica sp. nov.

https://zoobank.org/CDF2D8DB-3DFB-4A88-932F-B33CF58D2912

Figs 6, 19

Type-material. ***Holotype*** male, Sipapo River and Orinoco River confluence (05°04'04.7"N, 67°47'37.4"W, Amazonas, Venezuela), 27.xii.2002, OM Villarreal leg. (MNRJ 1571).

Diagnosis. The male of this new species is similar to *T. tenuissima* considering abdomen, chelicerae and pedipalp morphology. Both share a slender abdomen, laterally with five black patches, chelicerae with centrally placed 'a', large and bulky Gu apart from the extremely elongated 'T' (visible in lower view) by very large gap and pedipalps with filiform embolus not enfolded by the conductor and small triangular paracymbium (Figs 6A–I; Castanheira and Baptista 2020, figs 12A–I, 14A, B, E–G, 15A). However, *T. amazonica* sp. nov. can be easily differentiated from *T. tenuissima* by chelicerae with much thinner 'a', absent 'sl', 'T' with curved tip, presence of CRu and CRl, Gl straight and apart from L2 by much larger gap and pedipalps with embolus apart from conductor since its middle portion and longer paracymbium with notch longer and distalward projected (Fig. 6D–J).

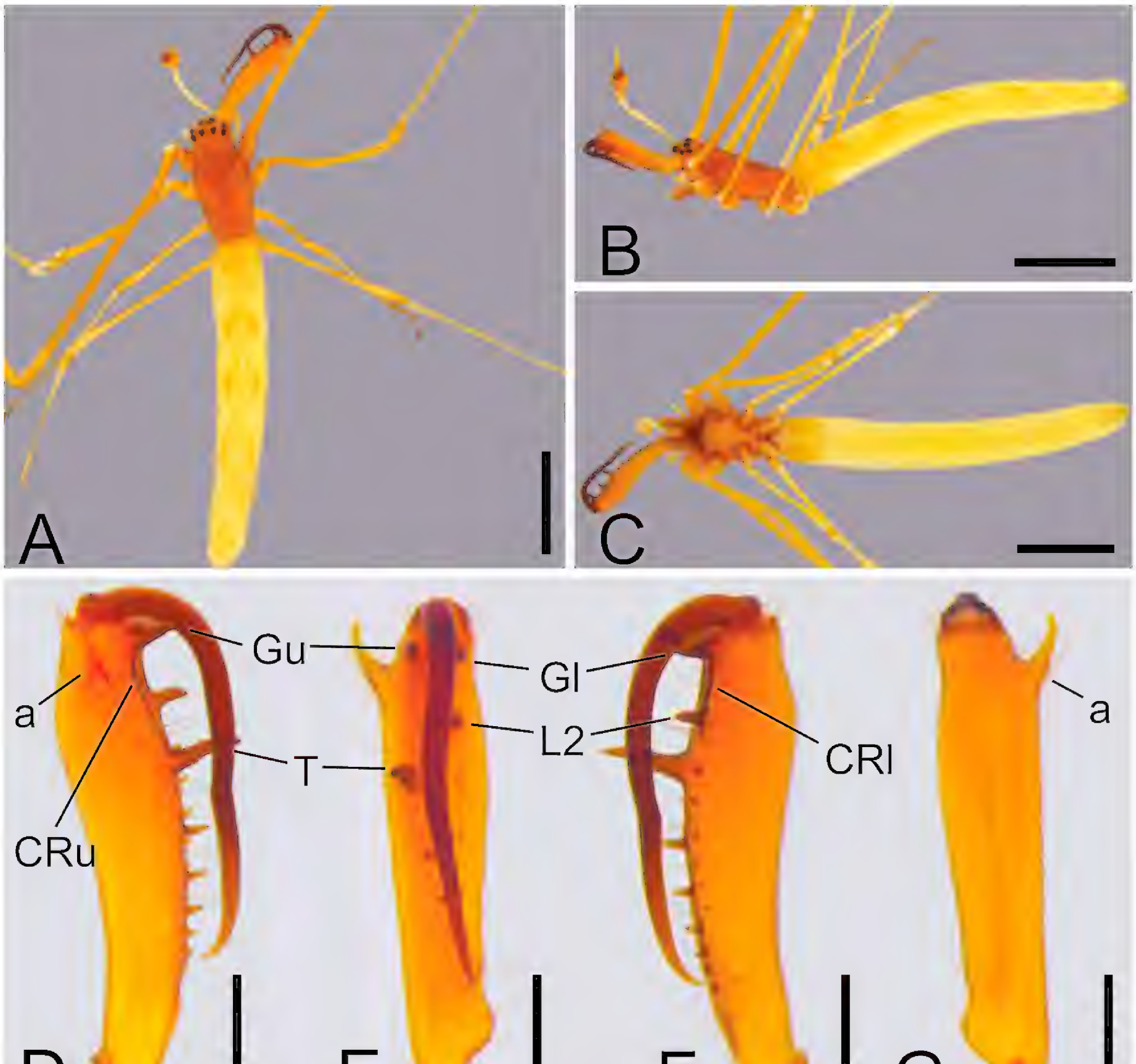


Figure 6. *Tetragnatha amazonica* sp. nov. male (MNRJ 1571). **A.** Dorsal habitus; **B.** Lateral habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–J.** Left pedipalp; **H.** Mesal view; **I.** Dorsal view; **J.** Ventral view (paracymbium). Scale bars: 2 mm (**A–C**); 0.5 mm (**D–J**).

Description. Male (based on holotype MNRJ 1571): Carapace elongated, slightly elevated anteriorly and light brown (Fig. 6A, B). Labium longer than wide and reddish brown (Fig. 6C). Sternum oval and light brown, with no marks or contour (Fig. 6C). Eyes with ALE and PLE touching (Fig. 6A). Legs very elongated and yellow, legs I and II slightly darker (Fig. 6A–C). Chelicera paturon approximately 4.3× longer than wide and 1.15× smaller than carapace, heavily curved outwards, around 55° from body median line, very thick and with orange hue (Fig. 6A, D–G). 'a' tubular, with small dent on inner margin of its tip and located in midway position of paturon (Fig. 6D, E, G). AXu and 't' absent (Fig. 16D, E). Upper row with eight teeth distalward projected (Fig. 6D, E): Gu very long and thick, with very broad basis and apart from 'T' by a conspicuous upper crest (CRu) on large gap; 'sl' absent; 'T' conspicuous and elongated, sclerotized, and pointed with a curved tip; 'rsu' composed of six pointed teeth, decreasing in size and apart by regular small gaps. AXl absent (Fig. 6E, F). Lower row with eight teeth (Fig. 6E, F): Gl triangular, very thick, sclerotized, straight and bearing rounded blunt tip, apart from L2 by large gap following extremely sclerotized dark lower crest (CRl), that goes slightly beyond L2; L2 also very thick, sclerotized, and straight (or slightly basalward projected) with large tip and apart from L3 by smaller gap than Gl–L2; 'rsl' composed of extremely reduced teeth, apart from one another by small gaps. Cheliceral fang thick, uniformly tapering to its tip, slightly wavy from midway and closing between teeth rows (Fig. 6D–F). Abdomen approximately 2.6× longer than carapace, slender, and pale beige, covered by sparse guanine crystals with five dusky dark patches on each size of dorsum (Fig. 6A–C). Pedipalps with extremely elongated cymbium, around 2.9× longer than wide and rounded tibia, bearing wide basis and no apical constriction (Fig. 6H–J); tegulum approximately 1.4× wider than long and inflated (Fig. 16H); conductor elongated, ribbon-like and distally wider, not enclosing embolus and ending in broad twisted tip (Fig. 6H, I); embolus filiform, basally thicker and enlarged, ventrally bending from mid-way and resting its slender tip on conductor (Fig. 6H, I); paracymbium short, only 2.3× longer than wide, with transparent lobe occupying around 1/3 of its width, notch rounded and undivided, and knob large and triangular pointed (Fig. 6J).

Measurements. Total length 9.4. Carapace 2.1 long, 1.1 wide. Abdomen 7.3 long, 1.1 wide. Left chelicera 2.2 long, 0.4 wide. Leg formula I–II–IV–III. Leg I: femur 8.0, patella 0.8, tibia 8.3, metatarsus 9.2 and tarsus 1.9. Leg II: patella + tibia 4.9. Leg III: patella + tibia 1.6. Leg IV: patella + tibia 4.9.

Female. Unknown.

Etymology. The specific epithet "amazonica" means "from Amazon" in Latin, referring to the type-locality in Venezuela and the Amazon Forest biome.

Distribution. Only known from type-locality in Amazonas, Venezuela (Fig. 19).

Life history and habitat preferences. The single male holotype was collected in the summer (December). No information about habitat preferences were given on the original label.

Tetragnatha cristata sp. nov.

https://zoobank.org/3B6C51EA-2B99-4A8D-9F4C-008C88670983

Figs 7–9

Type-material. ***Holotype*** male, Lebon Régis (26°37'45.0"S, 54°06'48.0"W, Santa Catarina, Brazil), 15.vii.2006, R Lignau leg. (MCTP 43332). ***Paratypes*:** Argentina – **Misiones** • 1 male, 4 juveniles, San Pedro, Parque Provincial Cruce Caballero, 26°28'S, 53°58'W, 13–16.i.2005, C Grismado et. al. leg. (MACN-AR 31756); Brazil, **São Paulo** • 1 male, Onda Verde, Fazenda São João, 20°36'50.0"S, 49°17'56.0"W, I.1949, F Lane leg. (MZUSP 11408).

Additional material examined. Brazil – **Rio Grande do Sul** • 1 male, Cachoeira do Sul: Cordilheira, 30°13'S 52°50'W, 09.ix.1992, RG Buss leg. (MCTP 43334); • 2 males, 2 juveniles, same locality, 14.xii.1992, RG Buss leg. (MCTP 43333); • 1 male, same locality, Capanezinho, 30°18'S 52°59'W, 17.x.1992, RG Buss leg. (MCTP 3375); • 2 males, Caxias do Sul, Fazenda Souza, 29°10'04.0"S, 51°10'44.0"W, 11–12.x.1995, Eq. Lab Aracnologia leg. (MCTP 7313); • 1 male, Itaara, 29°36'36.0"S, 53°45'54.0"W, 05.i.2006, L Indrusiak leg. (MCTP 21569); • 1 male, same locality, 16.ii.2006, L Indrusiak leg. (MCTP 21570); • 4 males, 2 juveniles, same locality, 28.iii.2006, L Indrusiak leg. (MCTP 21571); • 1 male, Novos Cabrais, Parque Witeck, 29°44'06.0"S, 52°56'52.0"W, 11.ix.2008, RG Buss leg. (MCTP 28092); • 1 male, same locality, 01.xi.2008, RG Buss leg. (MCTP 28013); • 1 male, Pelotas, Capão do Leão, 31°46'19.0"S, 52°20'34.0"W, 27.xi.2000, ENL Rodrigues leg. (MCTP 11711); • 1 male, same data (MCTP 11727); • 1 male, same locality, 27.ii.2001, ENL Rodrigues leg. (MCTP 13180); • 4 males, 2 juveniles, Santa Maria, 29°41'02.0"S, 53°48'25.0"W, 15.x.1998, CB Kotzian and L Indrusiak leg. (MCTP 40632); **São Paulo** • 1 male, 3 juveniles, Itú, Fazenda Pau D'Alho, 23°15'50.0"S, 47°17'56.0"W, 17–18.ix.1960, P Biasi leg. (MZUSP 14747);

Diagnosis. *Tetragnatha cristata* sp. nov. most resembles *T. oncognatha* sp. nov. and *T. jaculator* by its similar small cylindrical body and small chelicerae, a small 'a' and long distalward projected 'T' (Figs 7A–E, G, 8A, 14A–E, G, 16A; Castanheira and Baptista 2021a, figs 56, 57, 59, 60, 62, 74). *Tetragnatha cristata* sp. nov. is easily differentiated by chelicerae with indented 'a', no AXu or AXl, much smoother rounded cheliceral bulge, and higher Gl, with large sclerotized lower crest not reaching L2, embolus dorsally opening on a rift on the conductor tip and the paracymbium with wider lobe and smaller notch (Figs 7D–J, 8A–E).

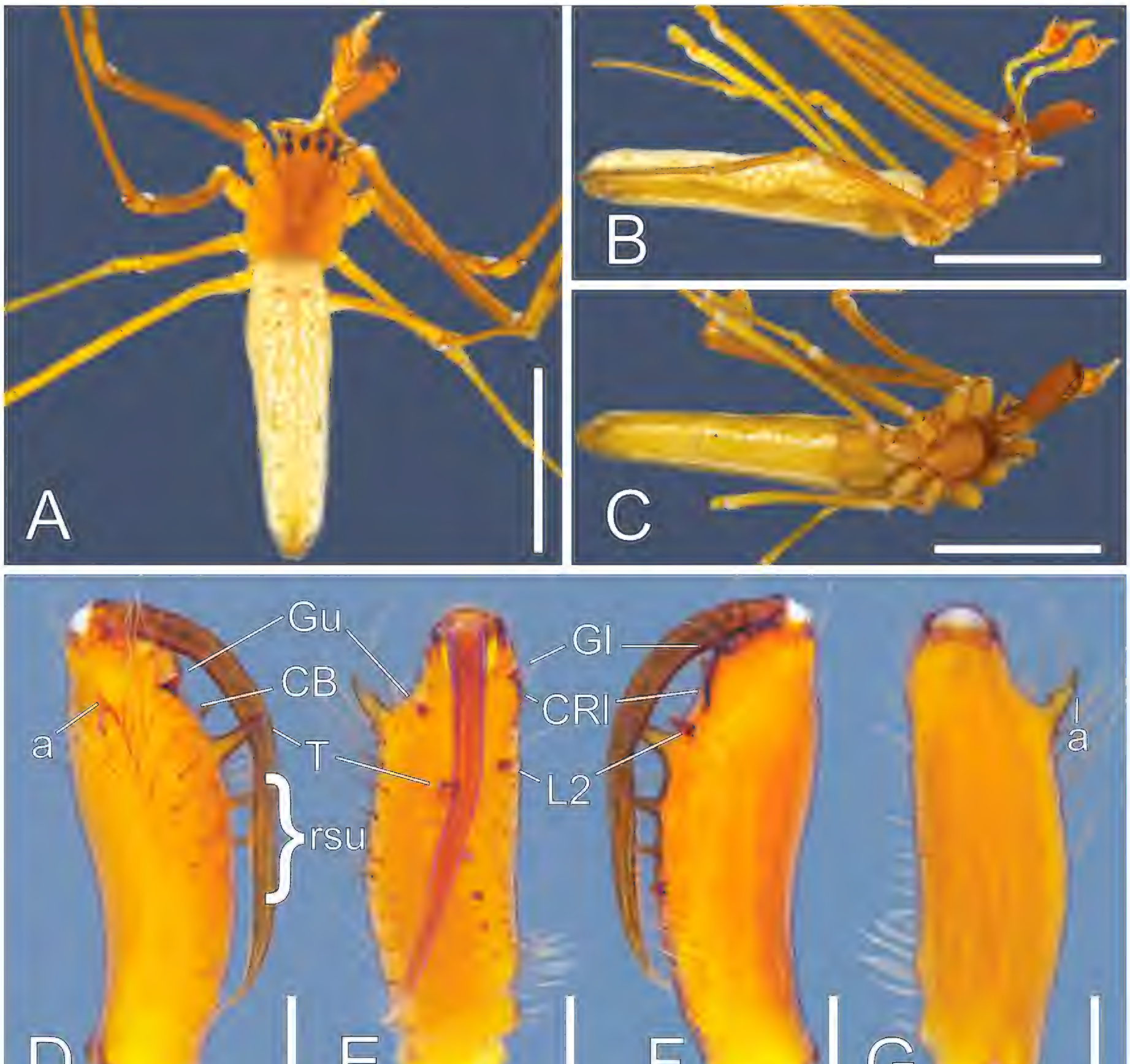


Figure 7. *Tetragnatha cristata* sp. nov. male holotype (MCTP 43332). **A.** Dorsal habitus; **B.** Lateral habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–J.** Left pedipalp; **H.** Mesal view; **I.** Dorsal view; **J.** Ventral view (paracymbium). Scale bars: 2 mm (**A–C**); 0.2 mm (**D–J**).

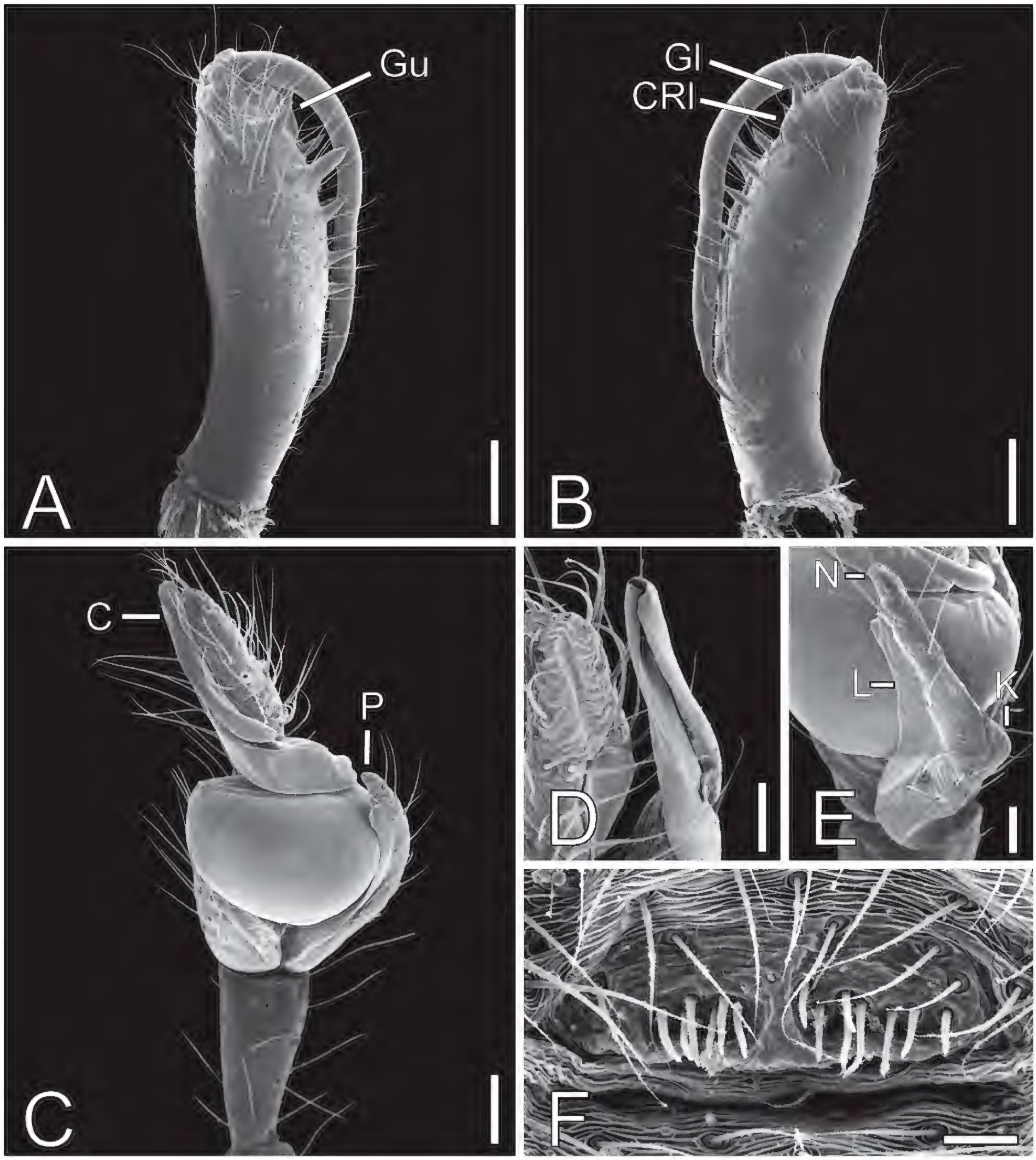


Figure 8. *Tetragnatha cristata* sp. nov. male SEM photos. **A, B.** Left chelicera (MCTP 21570); **A.** Upper view; **B.** Lower view; **C–E.** Left male pedipalp (MCTP 43334); **C.** Mesal view; **D.** Tip of conductor and embolus opening detail, dorsal view; **E.** Paracymbium detail, ventral view; **G.** Epiandrous field detail, ventral view (MCTP 43334). Scale bars: 0.2 mm (**A, B**); 0.1 mm (**C.**); 0.05 mm (**D, E**); 0.02 mm (**F**).

Description. Male (holotype MCTP 43332): Carapace oval and light brown, with two slightly darker thin parallel lines from cephalic furrow, passing through the fovea, and reaching posterior rim of carapace (Fig. 7A). Labium subquadrate and dark brown (Fig. 7C). Sternum light brown with dusky strikes (Fig. 7C). Eyes with ALE and PLE touching each other (Fig. 7A). Legs very elongated, yellowish brown with anterior pairs darker (Figs 7A–C). Chelicerae paturon about 3× longer than wide and around 1.6× smaller than carapace, moderately curved outwards, around 35° from body median line, moderately thick and orange-brown, bearing a smooth conspicuous bulge (CB) between teeth rows (Figs 7A, D–G, 8A, B). 'a' very short, rounded and distalward projected, deeply dented on its inner margin from its middle up to tip (Figs 7D, E, 8A). AXu absent (Figs 7D, E, 8A). Upper row with six uneven teeth

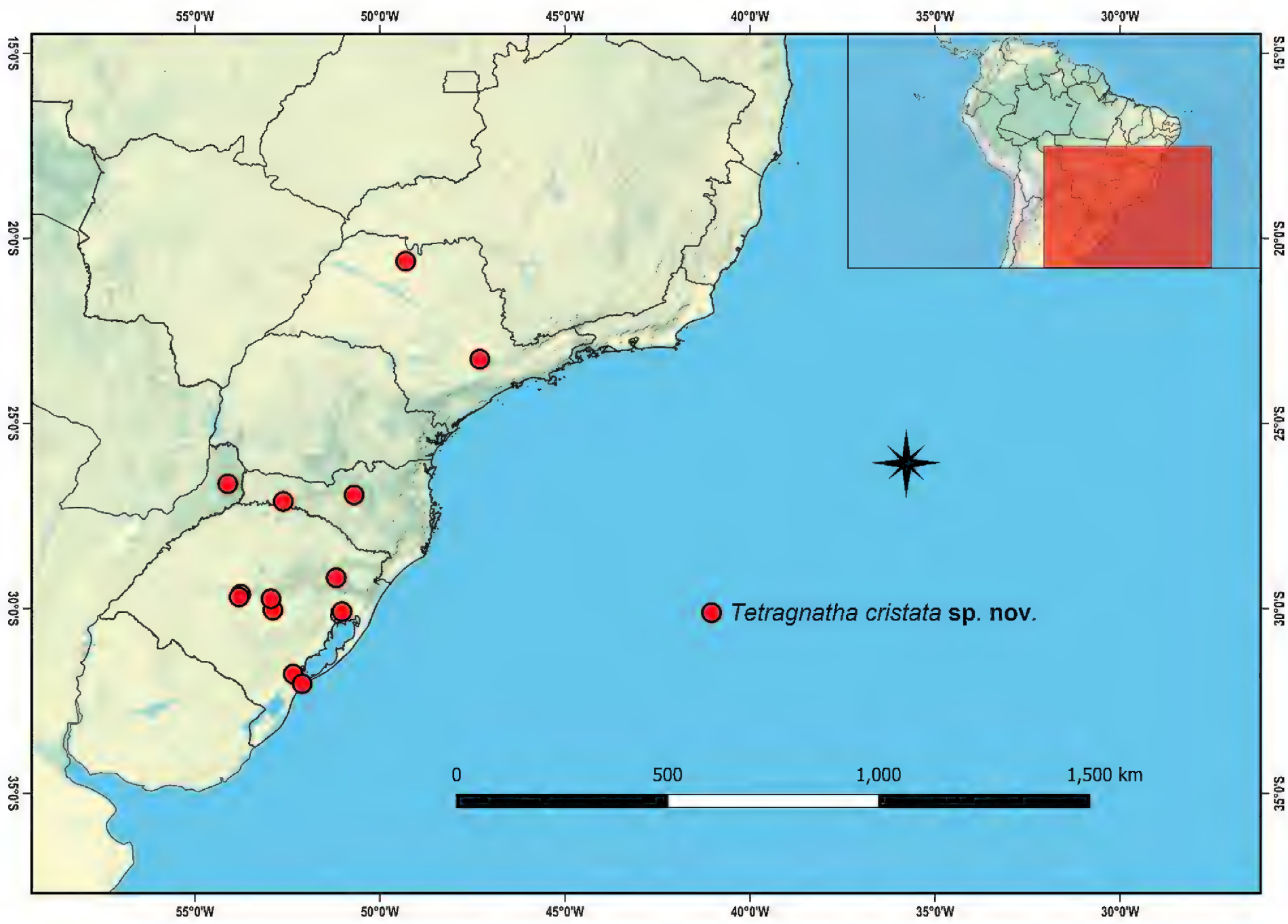


Figure 9. Distribution of *T. cristata* sp. nov.

distalward projected (Figs 7D, E, 8A): Gu thick, pointed, slanted and displaced from fang furrow and row itself, apart from 'T' by large gap formed by a cheliceral bulge; 'sl' absent; 'T' straight and pointed, with narrow basis and 'rsu' with four almost straight pointed teeth, decreasing in size, with the last one much smaller than the others. AXl absent (Figs 7E, F, 8B). Lower row with two teeth of same size (Figs 7E, F, 8B): Gl not very elongated, thick, sclerotized and completely pointing distalward and slightly downward, being apart from L2 by a large, straight, and very sclerotized conspicuous lower crest (CRl); L2 thin, pointed and distalward projected, with sclerotized basis. Cheliceral fang as wide as its base, moderately thick, and closing between 'T' and U3 (Figs 7D–F, 8A, B). Abdomen around 2× longer than carapace, cylindrical and beige, dorsally covered by guanine crystals, and bearing lateral brown line (Fig. 7A–C). Epiandrous field wide and flat, with large distal part, and bearing six and seven spigots respectively, in two bands apart by a broad midway division (Fig. 8F). Pedipalps with elongated cymbium, distally bending outwards, around 2.2× longer than wide and rounded tibia (Figs 7H, I, 8C); tegulum around 1.6× longer than high, spherical and inflated (Figs 7H, I, 8C); conductor thin, twisted near midway, with thick edges wrapping around embolus as a thick pouch on its median portion, and projected as a keel near tip (Figs 7H, I, 8C, D); embolus thick, originating at the middle portion of the bulb, near the cymbium and dorsally opening in middle of the conductor wrap (Figs 7H, I, 8C, D); paracymbium very elongated, around 2.8× longer than wide, boomerang-shaped, and bearing a notch with curved tip, translucent lobe occupying around half of the paracymbium width, and knob not projected (Figs 7J, 8E).

Measurements. Total length 5.1. Carapace 1.5 long, 0.9 wide. Abdomen 3.7 long, 0.8 wide. Left chelicera 0.9 long, 0.3 wide. Leg formula I–II–IV–III. Leg I: femur 4.7, patella 0.6, tibia 5.1, metatarsus 5.3 and tarsus 1.4. Leg II: patella + tibia 2.9. Leg III: patella + tibia 1.2. Leg IV: patella + tibia 1.6.

Female. Unknown.

Etymology. The specific Latin epithet "*cristata*" is an adjective meaning "with a crest or ridge", and refers to the large crest between the two first teeth at the lower row of the male cheliceral furrow.

Variation. Males (n = 8): total length, 4.16 – 5.79. Males can have three additional lower teeth in the chelicerae, decreasing in size after L2 (e.g., Fig. 8B, MCTP 21570).

Distribution. The distribution of this species ranges from São Paulo state to Rio Grande do Sul state, both in Brazil, passing through Misiones, Argentina (Fig. 9).

Life history and habitat preferences. Mature specimens of *T. cristata* sp. nov. were collected in the hottest months of the year: January, February, March, September, October, November and December, pointing to a possible early summer/late spring maturity. Only one specimen was collected in July, during winter. No information on habitat preferences was provided in the original labels.

Tetragnatha didorata sp. nov.

https://zoobank.org/09D75146-A443-4DF7-A331-69709193601F

Figs 10, 19

Type-material. ***Holotype*** male, Torres (29°20'06.0"S, 49°43'37.0"W, Rio Grande do Sul, Brazil), 26.iii.2006, ELC da-Silva leg. (MCTP 43335). ***Paratypes***: Brazil – **Pará** • 1 male, Belém, Reserva Mocambo, 01°26'28.7"S, 48°24'46.2"W, 05.v.2008, BVB Rodrigues leg. (MPEG. ARA 031362); **Paraná** • 1 male, Cambará, 23°02'45.0"S, 50°04'26.0"W, iv.2011, AM Giroti leg. (IBSP 167755); **Santa Catarina** • 1 male, Lebon Régis, 26°55'44.0"S, 50°41'42.0"W, 15.vii.2006, R. Lignau leg. (MCTP 19580).

Diagnosis. Males of *Tetragnatha didorata* sp. nov. resembles *T. tenuissima* and *T. amazonica* sp. nov. considering the elongated slender abdomen; *T. bogotensis* considering cheliceral morphology as both share long and straight 't', and *T. renatoi* sp. nov. considering their pedipalp morphology with large subquadrate paracymbium (Fig. 6A–C, 10A–F, J, K, Castanheira et al. 2019, figs 1C, E, F, 3C, Castanheira and Baptista 2020, figs 4I, 6F, 12A, B). *Tetragnatha didorata* sp. nov. differs from *T. tenuissima* and *T. amazonica* sp. nov. by the presence of a projection after the spinnerets (Figs 10B, C), from *T. bogotensis* by 'a' not slanted and carved on its lower portion, absence of AXu, the more elongated and sclerotized 't', Gu and L2 smaller, absent AXl and much smaller teeth on lower row (Figs 10D–G), and from *T. renatoi* sp. nov. by the narrower translucent lobe, larger notch and larger knob (Fig. 10J, K).

Description. Male (holotype MCTP 43335): Carapace elongated, slightly elevated anteriorly and with orange hue (Fig. 10A, B). Labium longer than wide and yellowish brown (Fig. 10C). Sternum oval and yellowish brown, with no marks or contour (Fig. 10C). Eyes with ALE and PLE almost touching (Fig. 10A). Legs very elongated, with yellowish hue, with legs I and II slightly darker (Fig. 10A–C). Chelicera paturon very elongated, approximately 4.95× longer than wide and as long as carapace, slightly curved outwards, around 25° from body median line, moderately thick and yellowish brown (Fig. 10A, D–G). 'a' elongated, thin, straight distalward projected and constricted on inner margin of its tip, located close to fang groove on centre of paturon (Fig. 10D–G). AXu absent (Fig. 10D, E). 't' bulky, sclerotized, pointed and straight, forming the letter "L" with the apophysis (Fig. 10D, E). Upper row with eight teeth (Fig. 10D, E): Gu small, sclerotized and slightly distalward projected, located on a dark ridge apart from fang groove by large gap; U2–U7 of similar size, pointed and straight, U2–U3 apart by a large gap and remaining teeth apart from one another by small gaps. AXl absent (Fig. 10E, F). Lower row with nine teeth distalward projected (Fig. 10E, F): Gl small, triangular, pointed and sclerotized, located on fang groove and apart from L2 by very large gap; L2–L4 pointed and decreasing in size, apart by large gaps; L5–L9 extremely reduced in size, L7–L9 reduced to denticles. Cheliceral fang not thick, uniformly tapering to its tip and closing between teeth rows (Fig. 10D–F). Abdomen slender, approximately 2.7× longer than carapace, with a pointed end projection posterior to the spinnerets, pale yellow and completely covered by guanine crystals, with no lateral bands (Fig. 10A–C). Pedipalps with elongated cymbium, only around 1.2× longer than long and rounded tibia, medially bending outwards, bearing wide basis and with no apical constriction (Fig. 10H, I); tegulum about 1.4× wider than long and inflated (Fig. 10H); conductor elongated, distally projected and completely enfolding the embolus from its middle portion as a pouch, ending in rounded and twisted tip (Fig. 10H, I); embolus thick, filiform, sclerotized and twisted from mid-way, opening from below the conductor (Fig. 10H, I); paracymbium very long, around 3.3× longer than wide, subquadrate, bearing transparent lobe that occupies around 50% of paracymbium width, notch carved and rounded, and knob enlarged and mushroom-like (Fig. 10J, K).

Measurements. Total length 9.0. Carapace 2.5 long, 1.4 wide. Abdomen 6.6 long, 1.0 wide. Left chelicera 2.4 long, 0.6 wide. Leg formula I–II–IV–III. Leg I: femur 7.1, patella 0.9, tibia 6.8, metatarsus 7.5 and tarsus 1.6. Leg II: patella + tibia 4.4. Leg III: patella + tibia 1.7. Leg IV: patella + tibia 4.9.

Female. Unknown.

Etymology. The specific epithet "didorata" is the compound latinized form of the Greek words: "di" meaning "two" and "dory, dorata" meaning "spear", referring to the spear-like shape of the thin and long apophysis and the elongated and pointed 't' at the upper side of the male chelicerae.

Variation. Males (n = 3): total length, 7.0 – 9.0. Little variation in colour pattern.

Distribution. This species is mainly found at Paraná, Santa Catarina and Rio Grande do Sul, in the South region, but it was also collected in Pará state, in the North region, all in Brazil (Fig. 19).

Life history and habitat preferences. All specimens of *T. didorata* sp. nov. were collected during the autumn (late March, April and May) and the beginning of winter (July). No information on habitat preferences was given on the original labels of this species.

Tetragnatha laboriosa (Hentz, 1850)

Fig. 11

Tetragnatha laboriosa Hentz, 1850: 27, plate 4, fig. [male syntype destroyed; male neotype designated by Levi (1981) from USA, Massachusetts, Middlesex, Holliston, in MCZ 21762].

Additional records. Argentina – • *Tetragnatha americana*: one female, Río Santa Cruz, Santa Cruz, Patagonia (MNHN 3140). Chile: 6 males, 2 females (*T. americana*: Simon det., MNHN 12628).

Notes. See the section on *T. nitens* for additional information. Some of the specimens Simon (1896, 1905) identified as *T. americana* belong actually to *T. laboriosa*. We were able to analyse several specimens from Chile (MNHN 12628) and just one of the three females from Santa Cruz, Argentina (MNHN 3140, fig. 11) cited by Simon (1905) and confirmed that they are all typical *T. laboriosa*.

Figure 10. *Tetragnatha didorata* sp. nov. male (MCTP 43335). **A.** Dorsal habitus; **B.** Lateral habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–J.** Left pedipalp; **H.** Mesal view; **I.** Dorsal view; **J.** Ventral view (paracymbium); **K.** Paracymbium detail, ventral view. Scale bars: 2 mm (**A–C**); 0.5 mm (**D–J**); 0.2 mm (**K**).

Figure 11. *Tetragnatha laboriosa* under *T. americana*, female (MNHN 3140). **A.** Dorsal habitus; **B.** Original label citing Santa Cruz, Argentina; **C.** Ventral habitus; **D.** Left chelicera, inner view; **E.** Chelicerae, apical view.

Tetragnatha nitens (Audouin, 1826)

Figs 12, 13

Tetragnatha extensa (Linnaeus, 1758): Nicolet, 1849: 516, plate 4, figs 5, 5a–d (female, misidentified).

Eugnatha nitens Audouin 1826: 118, plate 2, fig. 2 (female).

Tetragnatha nitens: Walckenaer 1841: 209.

Tetragnatha labialis Nicolet 1849: 520 (female). New Synonymy.

Tetragnatha labialis: Keyserling 1865: 851, plate 21, figs 11–13 (male and female misidentified).

Tetragnatha americana Simon, 1896: CV–CVI (sex?), New Synonymy.

Tetragnatha labialis Simon, 1896: CVII (sex?); 1902: 25; 1904: 94.

Tetragnatha americana: Simon, 1905: 10 (male, female, misidentified).

Type-material. *Tetragnatha americana*: Unspecified number of syntypes from Peñaflor, Santiago, Chile, Lataste Coll., MNHN?, MHNS?, **presumed lost**. *Tetragnatha labialis*: Unspecified number of adult female syntypes from Santiago, Chile, Nicolet Coll. (female MNHN 4209, herein designated as lectotype), **examined**.

Additional Record. Chile – • 1 male from Punta Arenas (*T. americana*: Simon det., MNHN 22312), **examined**.

Notes. *Tetragnatha americana* was a new name Simon (1896, p. CV–CVI) applied to a species he considered as the same one misidentified as *T. extensa* and redescribed by Nicolet (1849, p. 516). He only added the following expression in a list of spiders from Chile assembled by F. Lataste: "*Tetragnatha americana* E. Sim. (= *extensa* Nicolet)". Those specimens were collected in Peñaflor, Santiago, Chile, and deposited at the "Museo Zoologico de la Escuela de Medicina", currently the Museo Nacional de Historia Natural, Chile (MHNS, see Díaz (2019)

for additional information). Simon (1905, p. 10) applied again without any justification the name *T. americana* to the species he considered as *T. extensa* sensu Nicolet, citing three females from Santa Cruz, Argentina. He listed *T. extensa* sensu Nicolet under the title of *Tetragnatha americana*, and included the bibliographical reference to the book, again without mentioning the examination of Nicolet's specimens or any morphological character. Simon (1905) added that the specimens he had from Santa Cruz "were not different from *T. americana* of Chile, where the species is very common".

Despite Simon (1896, 1905) not clearly stating that he intended to add a new replacement name for *T. extensa* sensu Nicolet, no previous citation to *T. americana* was found after an analysis of Simon's papers dealing with spiders from Chile. Following Bonnet (1959, sub "*T. americana* Simon, 1897", p. 4317) and against Roewer (1942, p. 988) and the World Spider Catalog (2022), we consider 1896 and not 1905 as the year of the proposition of the new name *T. americana*. The citation by Simon (1896, p. CV) was apparently the first appearance of the name and it is available under the International Code of Zoological Nomenclature (ICZN 1999), following its article 12, which establishes that an unambiguous reference to a species' description suffices to make available a name published before 1931.

The type-series of *T. americana* Simon, 1896 is therefore composed of the specimens from Peñaflor examined by Simon (1896) when proposing the new name and also the specimens from Valdivia province studied and illustrated by Nicolet (1849), but not by the specimens from Santa Cruz, Argentina (Fig. 11) and unspecified localities of Chile cited by Simon (1905). According to the article 72.4.1.1 and its example, all the specimens studied by the species' author or referred unambiguously to in the original description constitute the type series. As stated by Levi (1967, 2001), Nicolet probably returned to Paris in 1846 and brought with him a large part of the types of Chilean species he described. Levi was able to find at MNHN types of many species of Theridiidae, but he considered most Araneidae types as lost. We also have not been able to find most Tetragnathidae types of species described by Nicolet in MNHN, excepting *T. labialis*. We requested information about *Tetragnatha* specimens from the MHNS but did not receive an answer and there is no evidence that any of Nicolet or Simon's specimens are still available in this institution. Because *T. labialis* was found in MNHN, we consider that this was probably the same depository institution for the other species described by Nicolet (1849) and the specimens from Valdivia province described as *T. extensa*. However, except for *T. labialis*, no other original specimen from Nicolet (1849) was found at MNHN. Likewise, *T. americana* specimens identified by Simon from Peñaflor and Santiago were also not found in the general collection of the MNHN. Therefore, we consider the syntypes of *T. americana* presumed lost.

Nicolet's description focused on the shape and size of structures such as carapace, eyes, abdomen, chelicerae and pedipalps, but did not include precise details on chelicerae and genital morphology to allow species identification. Fortunately, he also provided relatively good drawings (Nicolet 1849, plate 4, fig. 5), which clearly depict a female specimen of *T. nitens*, based for example on the sinuous cheliceral fang, Gu and U2 large and of similar size and well-spaced, and AXl large but not overreaching the fang basis. So, the description and illustrations by Nicolet (1849) are the only reliable information on the type series we recovered.

We were able to analyse all the specimens currently present in the MNHN collection and identified as *T. americana* by Simon. Some of these are specimens

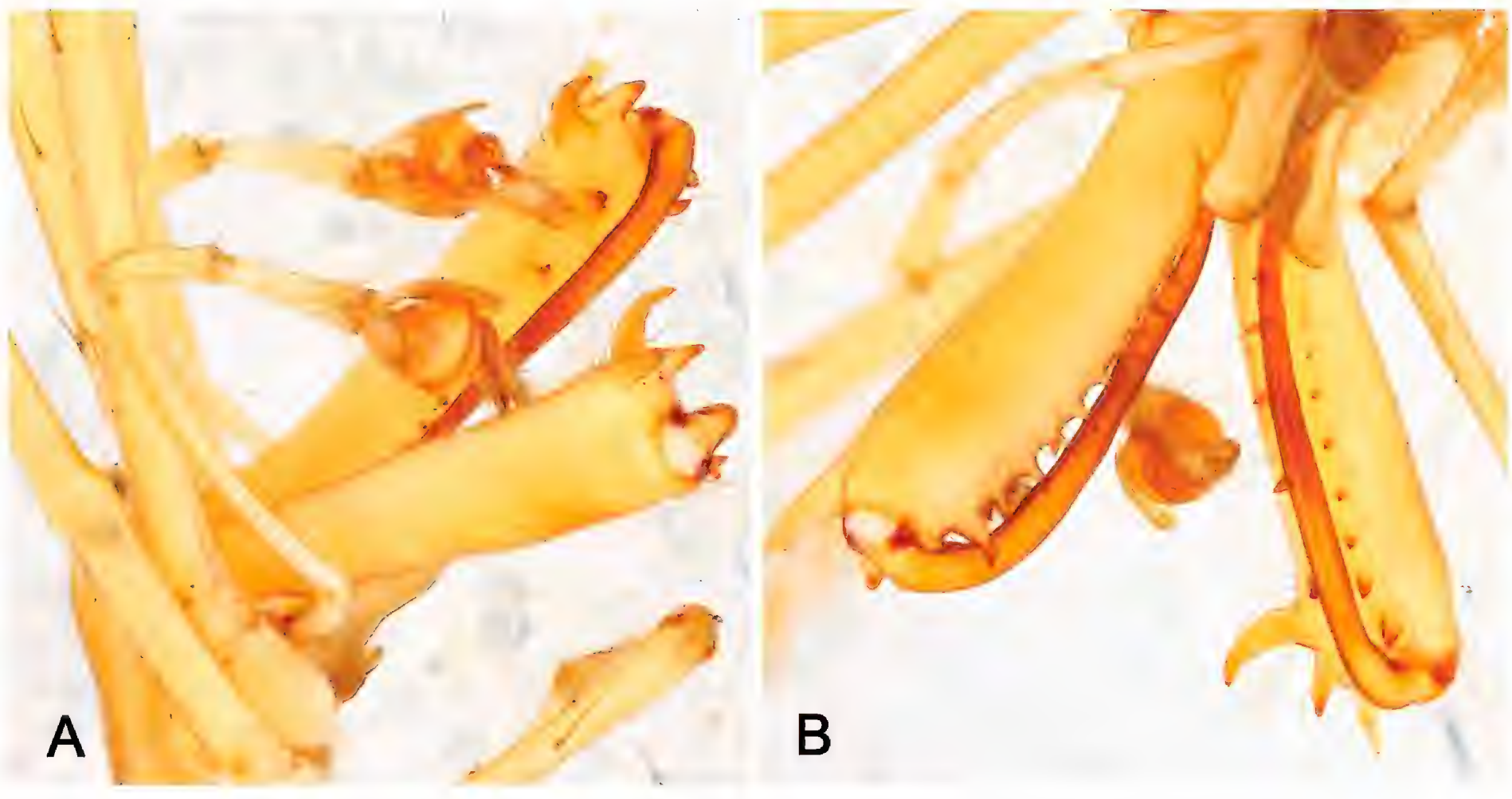


Figure 12. *Tetragnatha nitens* under *T. americana*, male. **A.** Left chelicera, inner view; **B.** Chelicerae, slanted lower view.

of *T. laboriosa*, represented by several specimens from Chile (MNHN 12628) and just one of the three females from Santa Cruz, Argentina (MNHN 3140, Fig. 11) cited by Simon (1905). On the other hand, there is a male from Punta Arenas, Chile, that is clearly *T. nitens* (MNHN 22312, Fig. 12). Although these specimens are just additional material examined, they were identified by Simon himself, thus helping to establish his concept of *T. americana*. Although some specimens Simon identified as *T. americana* are in fact *T. laboriosa*, the original drawings of a female syntype of "*T. extensa*" from Nicolet and secondarily the male from Punta Arenas (MNHN 22312, Fig. 12) identified by Simon allow us to indicate that *Tetragnatha americana* Simon, 1896 is *Tetragnatha nitens* (Audouin, 1826) syn. nov.

As mentioned above, the only species dealt with by Nicolet (1849) that we were able to locate at MNHN was *T. labialis*, described based on an unspecified number of female syntypes from Santiago, Chile. A female specimen (MNHN 4209), labelled as "*Tetragnatha labialis* Nicol. Gay Saint Iago" (Fig. 13) was examined. This female clearly belongs to the syntype series examined by Nicolet and is herein designated as lectotype. Following Castanheira et al. (2019), this specimen is clearly *T. nitens*, as shown for example by the following diagnostic cheliceral characters: Gl distalward followed by smaller L2 and L3, AXl reduced and point distalward, Gu elongated and not contiguous to U2 and robust basal cusp placed at the lower side of fang (Fig. 13A–C). Therefore, we propose *Tetragnatha labialis* Nicolet 1849 = *Tetragnatha nitens* (Audouin, 1826) syn. nov. Additionally, the male and female specimens from Nova Granada (probably Colombia) named *T. labialis* by Keyserling (1865) are misidentified. The original drawings of the chelicerae

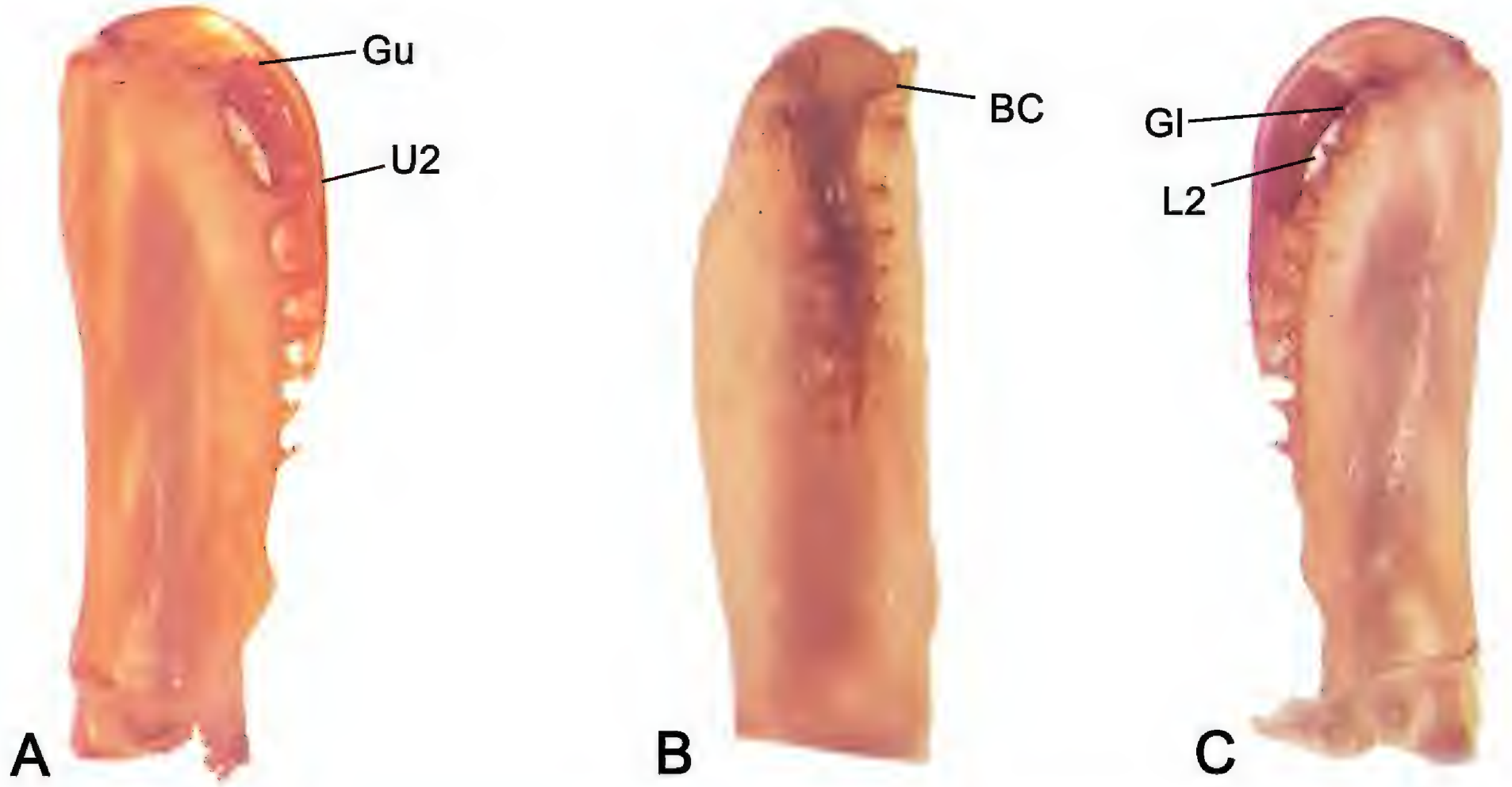


Figure 13. *Tetragnatha nitens* under *T. labialis*, female lectotype (MNHN 4209). **A.** Left chelicera, upper view; **B.** Left chelicera, inner view; **C.** Left chelicera, lower view; **D.** Original label.

resemble *T. argentinensis* (Keyserling 1865, fig. 11–13) or perhaps some related, undescribed species from Colombia. Furthermore, the original locality (Nova Granada) is too far north of the currently known *T. argentinensis* distribution range (Cargnelutti et al. 2022). The Chilean specimens of *T. labialis* cited by Simon (1902, 1904) from Valdivia and Punta Arenas, respectively, were not found at MNHN. Only a male from *T. americana* from Punta Arenas was located as we explained above (Fig. 12).

Tetragnatha oncognatha sp. nov.

https://zoobank.org/80CF5C91-DFC5-4763-A764-2949E0B47F9F

Figs 14–17

Type-material. ***Holotype*** male, Rancho Queimado (27°40'22.0"S, 49°01'19.0"W, Santa Catarina, Brazil), 09–13.x.1995, AA Lise leg. (MCTP 7067). ***Paratypes*:** Brazil, **Rio de Janeiro** • 1 male, 1 juvenile, Itatiaia, Parque Nacional de Itatiaia, 22°29'29.0"S, 44°33'33.0"W, 20–22.xi.2008, DT Castro leg. (UFRJ 0423); **Rio Grande do Sul** • 1 male, Guaíba, Fazenda São Maximiliano, 30°06'50.0"S, 51°19'30.0"W, 14.vii.1995, AA Lise leg. (MCTP 6688); • 1 male, 1 female, São Francisco de Paula, 29°26'52.0"S, 50°35'02.0"W, 05–09.iii.1997, AA Lise leg. (MCTP 15965).

Additional material examined. Brazil – **Rio Grande do Sul** • 1 female, Novos Cabrais, 29°44'06.0"S, 52°56'52.0"W, 27.i.2010, RG Buss leg. (MCTP 43654); • 1 male, São Francisco de Paula, Potreiro Velho, 29°24'47.9"S, 50°15'36.8"W, 12–14.xi.1998, AA Lise leg. (MCTP 12037); • 1 male, same locality, 04–06.i.1999, AA Lise leg. (MCTP 15792); • 2 males, 2 females, same locality, 14–17.xii.1996, AA Lise leg. (MCTP 43336); • 1 male, Santo Antônio da Patrulha, 29°49'04.0"S, 50°31'12.0"W, 27.viii.1994 (MCTP 4929); • 1 male, Viamão, 30°04'51.0"S, 51°01'22.0"W, 07.xi.1995, AA Lise et. al. leg. (MCTP 43337); • 1 male, Viamão, Itapuã, , 30°17'02.7"S, 51°01'23.3"W, 29.v.2004, BP Zambonato leg. (MCTP 33638); **Santa Catarina** • 1 male, Florianópolis: Morro das Aranhas, Costão do Santinho, 27°28'05.9"S, 48°22'49.8"W, 2007, F Albertoni leg. (IBSP 144176); **São Paulo** • 1 female, São Paulo, Parque Ilha dos Eucaliptos, Jardim Ângela, Reservatório de Guarapiranga, 23°44'00.0"S, 46°44'01.5"W, 07–13.x.2003, I Cizauskas and CRM Garcia leg. (IBSP 61361).

Diagnosis. Males of *T. oncognatha* sp. nov. share with *T. cristata* sp. nov. and *T. jaculator* similar small-sized cylindrical bodies and small chelicerae, with 'a' small sized and 'T' long distalward projected (Figs 7A–E, G, 8A, 14A–E, G, 16A; Castanheira and Baptista 2021a, figs 56, 57, 59, 60, 62, 74). However, *T. oncognatha* sp. nov. is easily identified by chelicerae with small AXu, much more conspicuous and rounded cheliceral bulge, and deep lower crest beginning before Gl and ending after L2, embolus opening inside ventral portion of conductor and paracymbium with narrower lobe and longer notch (Figs 14D–F, H–J, 16A, B, E–G). Females are similar to *T. guatemalensis* in regard to chelicerae and genitalia, but *T. oncognatha* sp. nov. is distinguished by chelicerae with much smaller U2 and L2, much larger gaps between Gl and L2 and between L2 and L3, no outer cusp, more rounded genital fold and internal genitalia formed by much larger central sac and two much more rounded spermathecae (Figs 15D–I, 16C, D).

Description. Male (holotype, MCTP 7067): Carapace elongated and, tapering toward slightly elevated anterior part, with rounded borders and yellowish brown colour hue with thin dark line rebordering its edges (Fig. 14A, B). Labium subquadrate and dark brown (Fig. 14C). Sternum oval and light brown, with no marks or contour (Fig. 14C). ALE and PLE touching each other (Fig. 14A). Legs yellowish brown with four pairs of spines on femur (Fig. 14A–C). Chelicerae paturon approximately 3.3× longer than wide and 1.6× shorter than carapace, moderately curved outwards, around 30° from body median line, moderately thick and with orange-brown colour hue, bearing a large and rounded conspicuous bulge (CB) between teeth rows (Figs 14A, D–G, 16A, B).'a' short, thick, out- and distalward projected, continuously bent from its basis, except in its last third, which bears a more abrupt curvature; with a carved tip, and located in middle portion of paturon (Figs 14D, E, 16A). AXu very reduced, almost a nub, located on fang furrow (Figs 14D, E, 16A). Upper row with six uneven teeth distalward projected (Figs 14D, E, 16A): Gu small, thick, pointed, slanted and displaced from fang furrow and row itself, apart from 'T' by a large gap formed by CB; 'sl' absent; 'T' elongated, thick, and very pointed, with very large basis; 'rsu' with four almost straight pointed teeth decreasing in size. AXl absent (Figs 14E, F, 16B). Lower row with seven teeth distalward projected (Figs 14E, F, 16B): Gl elongated, thick, finger-like and located on edge of fang furrow, alongside L2 on soft lower crest (CRl); L2 and L3 pointed, L2 more sclerotized and apart from L3 by a conspicuous gap, partially covered by CRl and L3 apart from L4 by a gap of same size; L4–L7 very pointed, L4 with almost same size as L6, L5–L7 decreasing in size, with L7 very reduced. Cheliceral fang moderately thick, and closing between teeth rows (Figs 14D–F, 16A, B). Abdomen medium-sized, around 1.9× longer than carapace, cylindrical and beige, dorsally covered by guanine crystals, bearing a lateral dark line (Fig. 14A–C). Epiandrous field oval and flat, with wide distal part, bearing six and eight spigots in two bands apart by a large midway division (Fig. 16H). Pedipalps with elongated cymbium, around 2× longer than short, distally bending laterad, with rounded tibia (Figs 14H, I, 16E); tegulum around 1.3× wider than long, spherical and inflated (Figs 14H, I, 16E); conductor twisted, only medially thicker and sclerotized, with wide tip completely enfolding embolus as a wide and projected pouch, which projects beyond embolus tip as a cap (Figs 14H, I, 16E, F); embolus short, thick and sinuous, originating at the middle portion of the bulb, near the cymbium (Figs 14H, I, 16E, F); paracymbium around 3.4× longer than wide, triangular, thick and moderately downward slanted at its tip, with a finger-like notch, translucent lobe occupying around 40% of the paracymbium length, neither reaching its basis, nor its apex, knob large and not projected (Figs 14J, 16G).

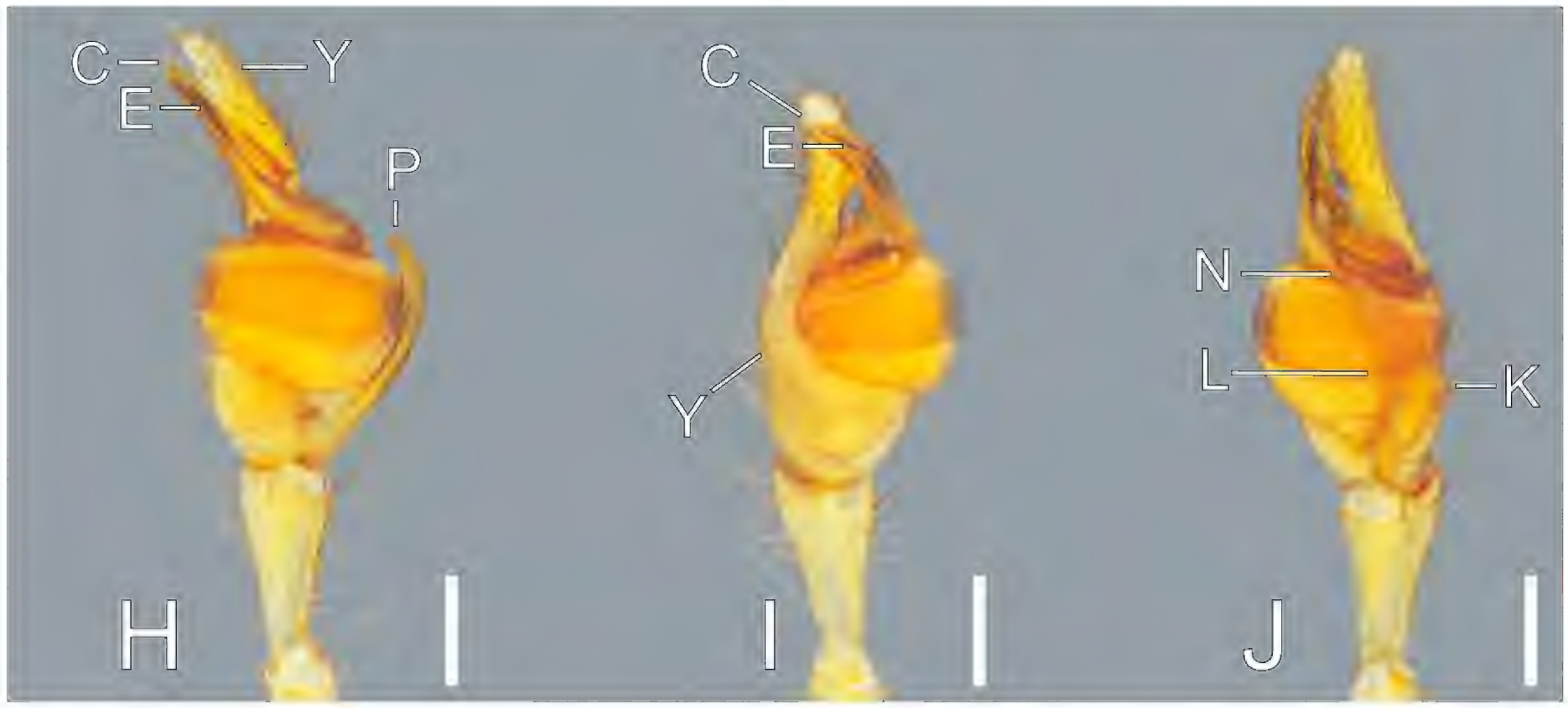


Figure 14. *Tetragnatha oncognatha* sp. nov. male holotype (MCTP 7067). **A.** Dorsal habitus; **B.** Lateral habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–J.** Left pedipalp; **H.** Mesal view; **I.** Dorsal view; **J.** Ventral view (paracymbium). Scale bars: 2 mm (**A–C**); 0.2 mm (**D–J**).

Figure 15. *Tetragnatha oncognatha* sp. nov. female paratype (MCTP 15965). **A.** Dorsal habitus; **B.** Lateral habitus; **C.** Ventral habitus; **D–G.** Left chelicera; **D.** Upper view; **E.** Inner view; **F.** Lower view; **G.** Outer view; **H–I.** Female genitalia; **H.** Genital fold, ventral view; **I.** Internal genitalia, dorsal view. Scale bars: 2 mm (**A–C**); 0.2 mm (**D–I**).

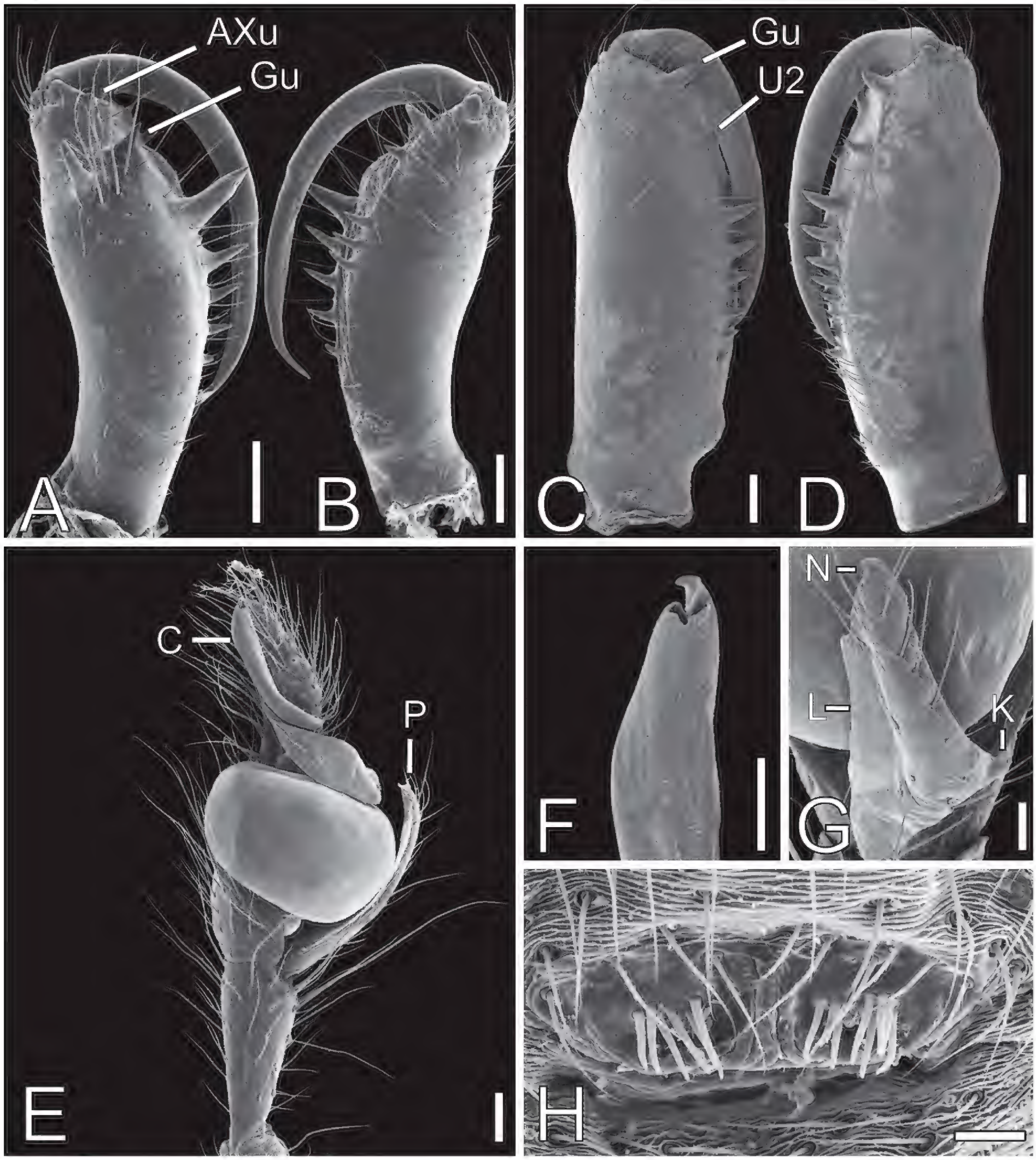


Figure 16. *Tetragnatha oncognatha* sp. nov. SEM photos. **A, B.** Male left chelicera; **A.** Upper view (MCTP 15965); **B.** Lower view (MCTP 15792); **C, D.** Female left chelicera (MCTP 43654); **C.** Upper view; **D.** Lower view; **E–G.** Left male pedipalp; **E.** Mesal view (MCTP 4929); **F.** Tip of conductor and embolus opening detail, ventral view (MCTP 15792); **G.** Paracymbium detail, ventral view (MCTP 15792); **H.** Epiandrous field detail, ventral view (MCTP 15965). Scale bars: 0.2 mm (**A–D**); 0.1 mm (**E**); 0.05 mm (**F, G**); 0.02 mm (**H**).

Measurements. Total length 6.1. Carapace 2.0 long, 1.3 wide. Abdomen 4.2 long, 1.1 wide. Left chelicera 1.2 long, 0.4 wide. Leg formula I–II–IV–III. Leg I: femur 2.9, patella 0.8, tibia 4.9, metatarsus 4.1 and tarsus 0.7. Leg II: patella + tibia 3.8. Leg III: patella + tibia 1.6. Leg IV: patella + tibia 2.4.

Female (paratype MCTP 15965): Carapace colour, maxillae, fovea, eyes, labium, and legs similar to male, but sternum dusky, with light brown spots between coxae (Fig. 15A–C). Chelicera paturon around 2.6× longer than wide, 1.9× shorter than carapace and bending around 25° from body median line, with similar colour hue as male (Figs 15A, D–G, 16C, D). AXu absent (Figs 15D, E, 16C). Upper row with seven teeth distalward projected (Figs 15D, E, 16C): Gu large, thick, pointed, very sclerotized and triangular, located on fang groove and apart from U2 by medium-sized gap; U2 small, with size similar to U7, triangular and pointed, apart

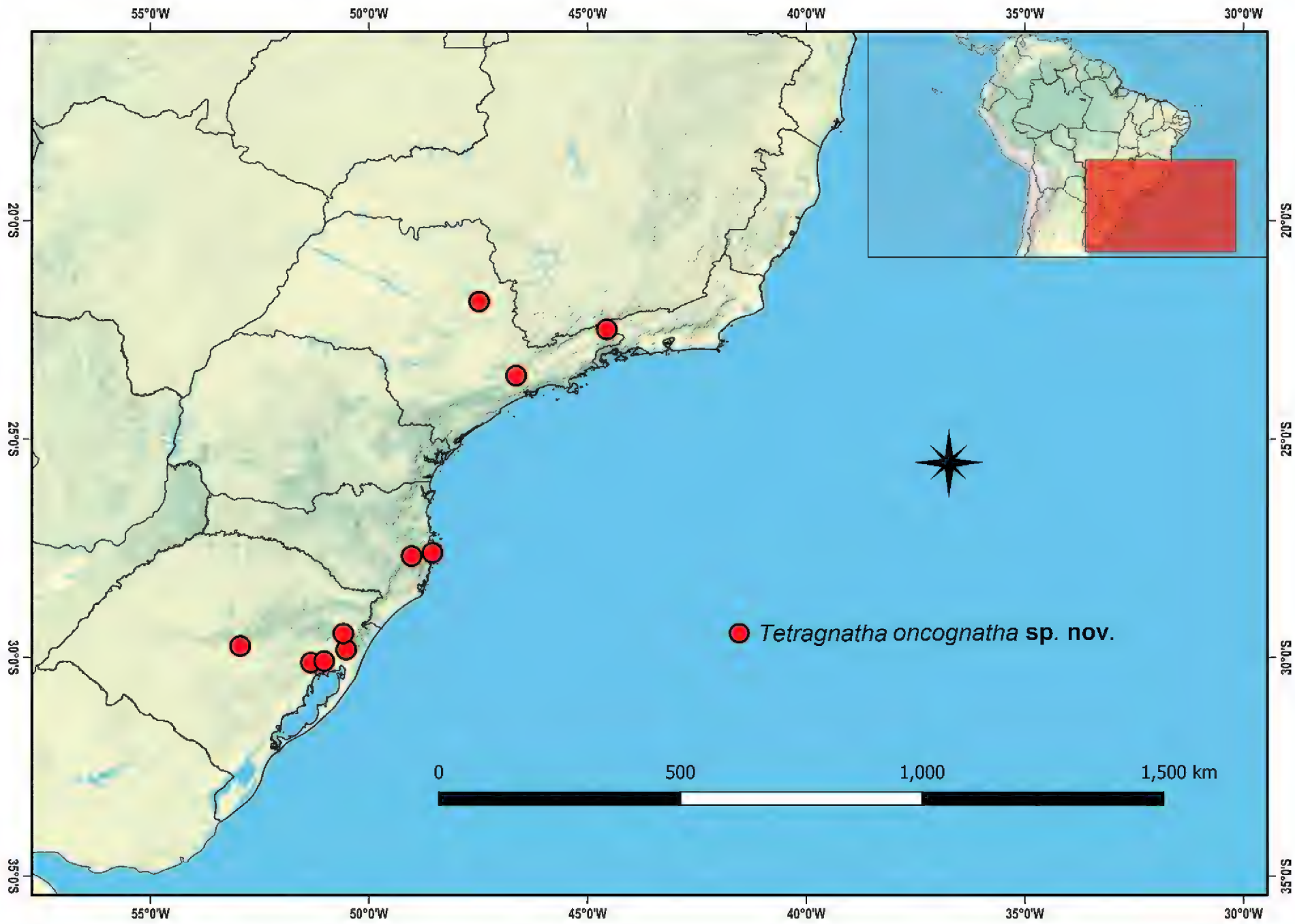


Figure 17. Distribution of *T. oncognatha* sp. nov.

from U3 by medium-sized gap; U3–U7 decreasing in size and pointed. AXl absent (Figs 15E, F, 16D). Lower row with six teeth distalward projected (Figs 15E, F, 16D): Gl triangular, thick and very sclerotized, located on fang groove and apart from L2 by medium-sized gap; L2 small, triangular and pointed, apart from L3 by medium-sized gap; L3–L6 decreasing in size and pointed. Cheliceral fang thick, uniformly tapering, serrated and abruptly curving from midway to its tip (Figs 15D–F, 16C, D). Abdomen slightly longer than that of male, around 2.6× longer than carapace, and bearing wider lateral black line (Fig. 15A–C). Genital fold short, around 4.7× wider than long, with a straight posterior rim and with beige colour hue (Fig. 15H). Internal genitalia with two massive globular spermathecae connected to a rounded *uterus externus*, and a large and oval central membranous sac, with very short stalk (Fig. 15I).

Measurements. Total length 8.5. Carapace 2.5 long, 1.4 wide. Abdomen 6.0 long, 1.4 wide. Left chelicera 1.1 long, 0.5 wide. Leg formula I–II–IV–III. Leg I: femur 4.4, patella 0.8, tibia 5.1, metatarsus 5.4 and tarsus 1.3. Leg II: patella + tibia 3.5. Leg III: patella + tibia 1.6. Leg IV: patella + tibia 3.1.

Etymology. The specific Greek epithet "*oncognatha*" refers to the gibbous, inflated chelicerae of both sexes, and is composed of the latinized form of the Greek "*onkos*" meaning "tumour, swell", and "*gnatha*" meaning "mouthpart, chelicera".

Variation. Males (n = 6): total length, 4.2 – 6.2. Male L3 may be absent, increasing the length of the gap (Fig. 14E, F vs. Fig. 16B). No conspicuous colour variations between specimens was detected.

Distribution. The distribution of this species ranges from Itatiaia in South-centre Rio de Janeiro state, through Rancho Queimado in Centre-east Santa Catarina state, to Guaíba in South-centre and Viamão in Northeast Rio Grande do Sul state, all in Brazil (Fig. 17).

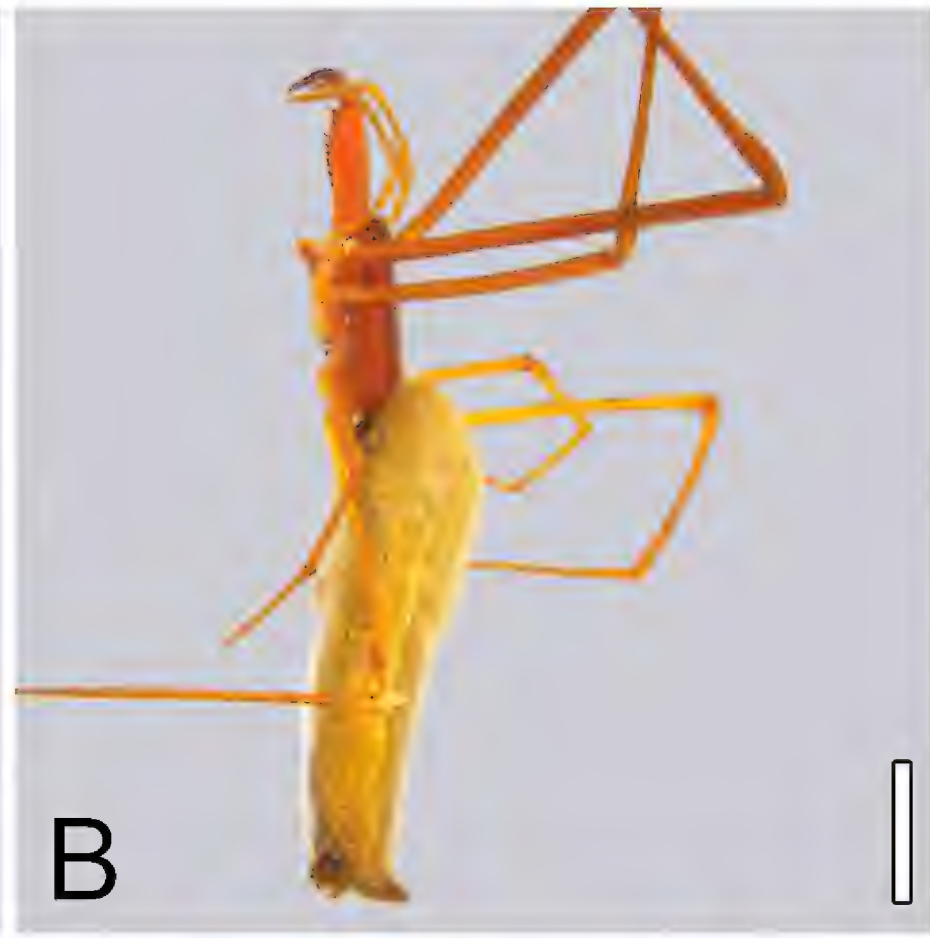
Life history and habitat preferences. Mature males and females of *T. oncognatha* sp. nov. were collected in January, March, May, July, August, and October to December, therefore the species does not seem to have a specific maturity period. No information on habitat preferences was provided on the original labels.

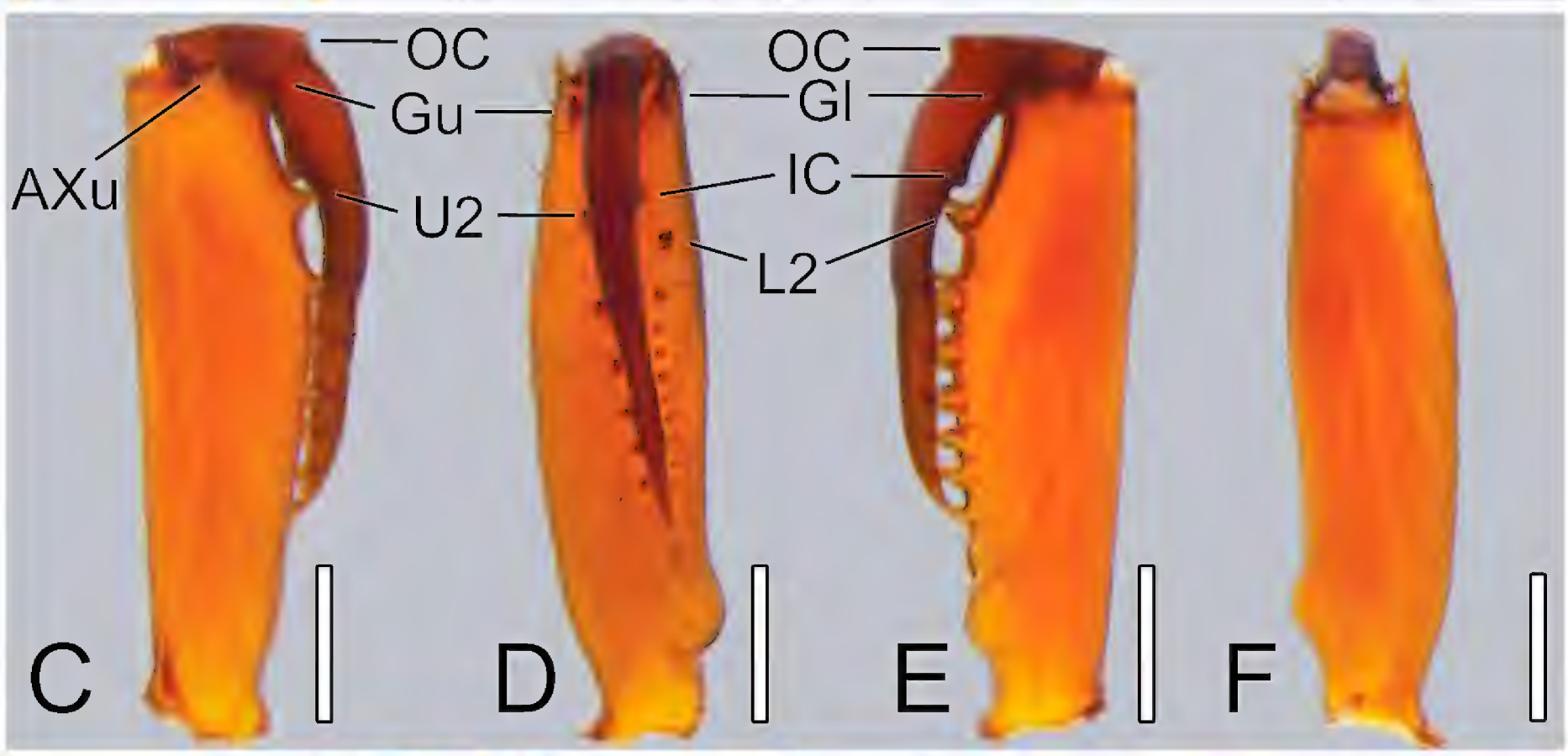
Tetragnatha pradoi sp. nov.

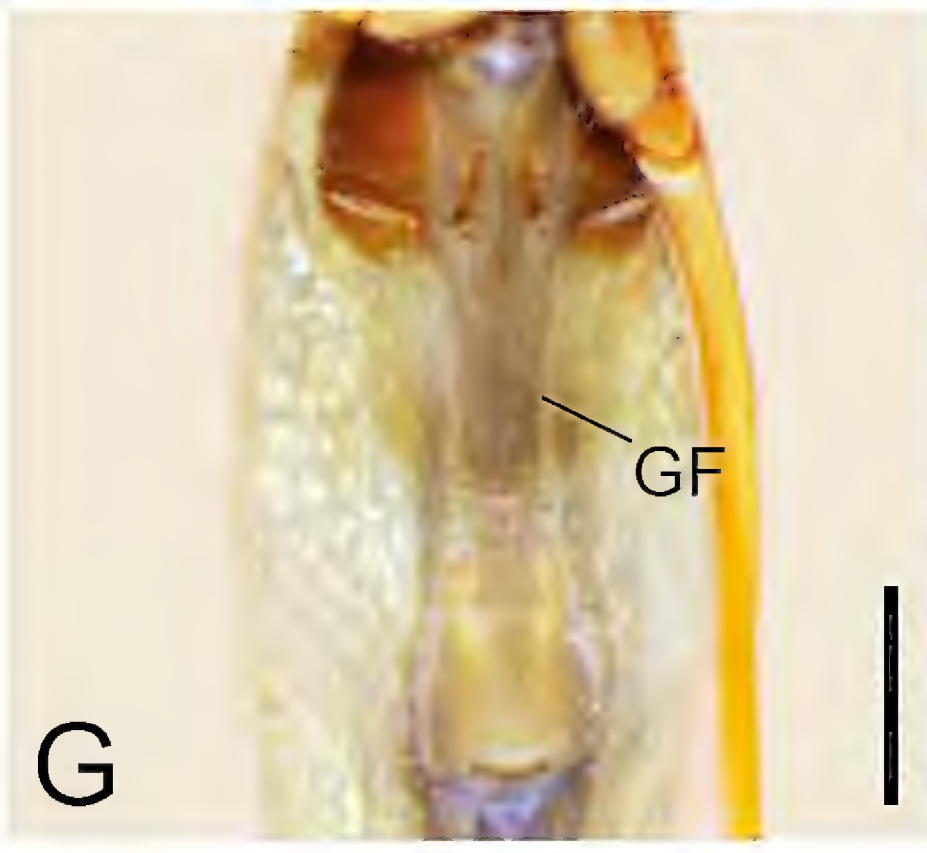
https://zoobank.org/59AC1FCF-61A5-4913-8EA0-28FE10C2540F

Figs 18, 19

Type-material. ***Holotype*** female, São Francisco de Paula, Potreiro Velho (29°24'47.9"S, 50°15'36.8"W, Rio Grande do Sul, Brazil), 05–08.xii.1996, AA Lise leg. (MCTP 14123). ***Paratypes***: Argentina – **Buenos Aires** • 2 females, Sierra de la Ventana, Hotel Provincial, 38°08'17.5"S, 61°48'02.6"W, 18.ii.1973 (MACN-AR 24550).







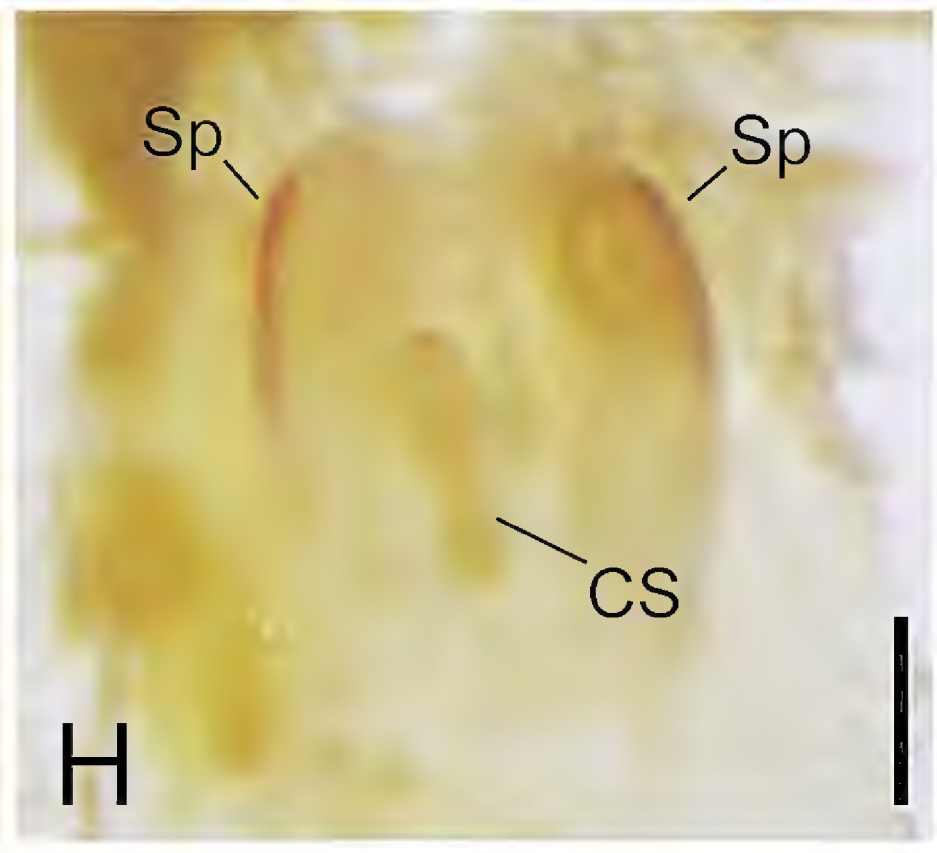


Figure 18. *Tetragnatha pradoi* sp. nov. female. **A–G.** Holotype female (MCTP 14123); **A.** Dorsal habitus; **B.** Lateral habitus; **C–F.** Left chelicera; **C.** Upper view; **D.** Inner view; **E.** Lower view; **F.** Outer view; **G–H.** Female genitalia; **G.** Genital fold, ventral view; **H.** Paratype female, internal genitalia, dorsal view (MACN-AR 2455). Scale bars: 2 mm (**A, B**); 0.5 mm (**C–F**); 1 mm (**G**); 0.2 mm (**H**).

Diagnosis. *Tetragnatha pradoi* sp. nov. seems similar to *T. nitens*, as both species share very elongated and bulky bodies, with abdomen much wider anteriorly, and similar chelicerae (Fig. 18A, B, Castanheira et al. 2019, fig.15A, B). Differently from *T. nitens*, however, *T. pradoi* sp. nov. has a short tail behind the spinnerets and AXu of the chelicerae is much more elongated, Gu and U2 slightly closer and fangs with an outer cusp and an inner cusp (differing from the basal cusp of *T. nitens*) (Fig. 18A–E; Castanheira et al. 2019, figs 15A–I, 16B). Also, the genital fold of this new species is the longest within *Tetragnatha*, even longer than that in *T. mandibulata*, identifying this species from all other in the genus (Fig. 18G).

Description. Female (based on holotype MCTP 14123): Carapace elongated, flattened and orange-brown, with two dark parallel lines from eyes, passing through fovea towards posterior rim (Fig. 18A). Labium 1 longer than wide and light brown. Sternum oval and light brown. AME and PME almost touching, and ALE and PLE touching (Fig. 18A). Legs very long, orange-brown (Fig. 18A, B). Chelicera paturon around 3.9× longer than wide, 1.3× shorter than carapace and around 20° from body median line, with orange-brown colour hue, (Fig. 18A, C–F). AXu elongated, pointed and distalward projected, with very large basis (Fig. 18C, D). Upper row with eight teeth distalward projected (Fig. 18C, D): Gu long and pointed, similar to AXu. but with narrow basis, and located on fang furrow, apart from U2 by a moderate gap; U2 similar to Gu and apart from it and U3 by moderate gaps of the same length; U3–U8 pointed and decreasing in size. AXl absent (Fig. 18D, E). Lower row with eleven teeth distalward projected (Fig. 18D, E): Gl elongated, pointed and sclerotized, apart from L2 by a large sclerotized gap; L2 with a moderate size, pointed and slightly displaced from the row itself, apart from L3 by a small gap; L3–L11 pointed and decreasing in size, L10 and L11 extremely reduced. Cheliceral fang thick, anteriorly enlarged and uniformly tapering to its tip, bearing a large triangular outer cusp near its basis and a small inner cusp on its first third (Fig. 18C–F). Abdomen almost 3.2× longer than carapace, cylindrical and anteriorly bulging, with beige colour hue, covered by sparse guanine crystals, and having a small tail after the spinnerets (Fig. 18A, B). Genital fold extremely elongated, around 1.7× longer than wide, narrowed midway, with a rounded posterior rim, and light brown colour hue (Fig. 18G). Internal genitalia with two rounded sclerotized and longer than wide spermathecae, connected to a large *uterus externus* and a cylindrical central membranous sac (Fig. 18H).

Measurements. Total length 11.1. Carapace 2.6 long, 1.5 wide. Abdomen 8.7 long, 2.1 wide. Left chelicera 1.8 long, 0.6 wide.

Male. Unknown.

Etymology. The specific epithet "pradoi" is a patronym honouring André Wanderley do Prado, work-colleague and friend of the authors, who gave a great deal of support throughout the development of all manuscripts on *Tetragnatha*.

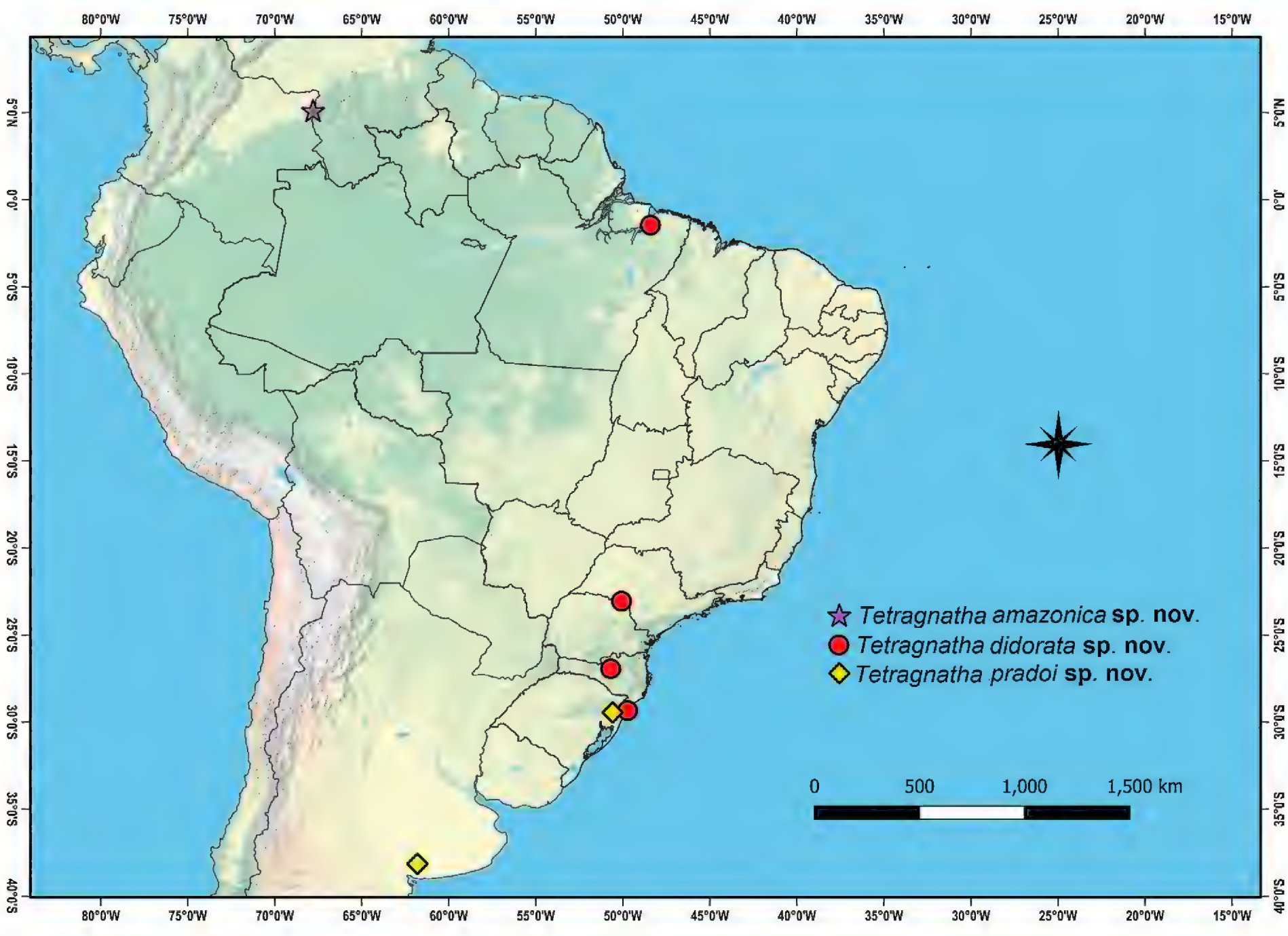


Figure 19. Distribution of *T. amazonica* sp. nov., *T. didorata* sp. nov. and *T. pradoi* sp. nov.

Remarks. Tibia, metatarsus and tarsus of the legs of the holotype were missing and consequently not measured.

Variation. Females (n = 3): total length, 8.2 – 11.1. Specimens do not conspicuously vary in colouration.

Distribution. From Brazil (Rio Grande do Sul state) to Argentina (Buenos Aires province) (Fig. 19).

Life history and habitat preferences. The only three females of *T. pradoi* sp. nov. we examined were collected in February and December. No information on habitat preferences was provided on the original labels.

Nomina dubia

The types of the following species are immature or presumed lost. Therefore, we are not able to correctly recognize the species. We cannot precisely identify them, nor clearly diagnose them in relation to other *Tetragnatha*. We considered a species as *nomen dubium* whenever its type-series was lost and original illustrations and descriptions were not very diagnostic, or when immatures could not be associated with adults.

Tetragnatha bishopi Caporiacco, 1947 *nomen dubium*

Tetragnatha bishopi Caporiacco 1947: 24 (juvenile)
Tetragnatha bishopi: Caporiacco 1948: 647

Type-material. *Tetragnatha bishopi*: Subadult female holotype from Demerara-Mahaica, Tibicuri-Cuyahà, Guyana, x.1931, Coll. Beccari (MZUF 531), **examined**.

Notes. This species was described by Caporiacco (1947) based on a female subadult specimen from Guyana, which was examined by the first author during a visit to MZUF. The holotype was in bad condition, with a broken abdomen, both small immature chelicerae detached from the body and had been dried and subsequently been placed into alcohol. Therefore, this species cannot be correctly identified and is considered a *nomen dubium*.

Tetragnatha linearis Nicolet, 1849 *nomen dubium*

Tetragnatha linearis Nicolet 1849: 517–518 (female).
Tetragnatha linearis: Keyserling 1865: 853, plate 21, fig. 23 (female).

Type-material. *Tetragnatha linearis*: Adult female syntypes from Chile, Nicolet? Coll., MNHN?, presumed **lost**.

Tetragnatha similis Nicolet, 1849 *nomen dubium*

Tetragnatha similis Nicolet 1849: 518–519, plate 4, fig. 6 (male).
Tetragnatha similis: Keyserling 1865: 840, plate 20, figs 21–23 (female, male).

Type-material. *Tetragnatha similis*: Female and adult? male syntypes from "Central Provinces", Chile, Nicolet? Coll., MNHN?, presumed **lost**.

Tetragnatha sternalis Nicolet, 1849 *nomen dubium*

Tetragnatha sternalis Nicolet 1849: 519 (female).

Type-material. *Tetragnatha sternalis*: Adult males and females syntypes from several localities in Chile, especially females from Llanquihue province, Nicolet? Coll., MNHN?, presumed **lost**.

Remarks. In the same book in which Nicolet (1849) misidentified *T. nitens* specimens as *T. extensa* and described *T. labialis*, he also described three other *Tetragnatha* from Chile: *T. linearis* Nicolet, 1849, *T. similis* Nicolet, 1849 and *T. sternalis* Nicolet, 1849. From these, only *T. similis* was accompanied by drawings, illustrating the dorsal habitus and eyes of an apparently immature male specimen, but they are not useful to correctly identify the species (see Nicolet 1849; plate 4, fig. 6). Also, as stated above, Nicolet's description were succinct and without precise details on chelicerae and genital morphology to allow species identifications.

Sixteen years later, Keyserling (1865) provided good illustrations for specimens from Nova Granada (current Colombia) he identified as *T. linearis* (see Keyserling 1865; plate 21, fig. 23) and *T. similis* (see Keyserling 1865; plate 20, figs 21–23). However, Keyserling (page 835) pointed out that the species described in works of Walckenaer, Nicolet, Hentz etc. cannot be determined with certainty, since the descriptions have not included enough characters to provide reliable clues for determining the species. He added that he preferred to apply the old names given by those authors rather than to propose possible superfluous new names to species that could be identical to the old ones. According to his drawings, *T. similis* sensu Keyserling looks very similar to *T. laboriosa* and *T. linearis* sensu Keyserling looks like *T. guatemalensis*. However, we could not confirm the identity of these specimens as we were not able to find the type-material for these species in MNHN, the same institution housing *T. labialis*. We consider *Tetragnatha linearis*, *Tetragnatha similis*, and *Tetragnatha sternalis nomina dubia*.

Discussion

Tetragnatha is a very speciose genus with 321 valid species/subspecies after this work and is among the most common and widespread spiders in the world (Levi 1981; Castanheira et al. 2019; Čandek et al. 2021; World Spider Catalog 2022). The genus includes species with characteristic cheliceral morphology, with long and numerous diagnostic teeth (see discussion on this structure in Castanheira et al. 2019). It has recently been the focus of a global biogeography study that supported the monophyly of the genus, but proved Caribbean species are not monophyletic, with multiple colonization events with low endemism and high diversity (Čandek et al. 2021). They also observed that *Tetragnatha* species are excellent dispersers but may suffer natural selection pressure and become endemic in certain islands (Čandek et al. 2021).

The results observed in Čandek et al. (2021) reflect a pattern also found in continental *Tetragnatha*, confirming that many species within the genus have broad distribution. These results are also observed in our study, with *T. bogotensis* (pantropical) and *T. nitens* (cosmopolitan) as the most widespread species in Argentina and Brazil and most species spread over more than one Brazilian state. Therefore, the taxonomic revision of a widespread genus like *Tetragnatha* in specific areas is important as a tool for understanding its local diversity.

Considering the large number of species world-wide, a global scale taxonomic study on *Tetragnatha* is almost impossible. However, there have been many country- to continental-scale revisions, the first of which covered North America (Seeley 1928) and Europe (Lendl 1886; Wiehle 1939, 1963). Neotropical studies included those for Mexico (Chickering 1957a), Jamaica (Chickering 1957b), Panama (Chickering 1957c), and Mexico again (Okuma 1992). Later, Levi (1981) again revised the genus for the United States and Canada. He was followed by the revisions in Australasia (Okuma 1987); Asia (Okuma 1988a, b); Hawaii (Gillespie 1992a, b; 2003a); Marquesas Islands (Gillespie 2003b); Society Islands (Gillespie 2003c); Canada (Dondale et al. 2003; Paquin and Dupérré 2003); and China (Zhu et al. 2003; Zhu and Zhang 2011). These revisions show that large biogeographic regions like Africa still lack a revision and that complementary revisions for the same continent or country acknowledge that taxonomic updates are necessary to understand the local fauna of *Tetragnatha*.

In South America, no taxonomic revision was previously carried out before the PhD thesis of the senior author (Castanheira 2020). This study was the first to deal with species from the region after the original descriptions of local species, substantially broadening the knowledge on South American *Tetragnatha* and resulting in a series of publications that added seven new *Tetragnatha* and proposed 32 taxonomic changes on species now considered junior synonyms, *nomina dubia* or *species inquirenda* (Castanheira et al. 2019; Castanheira and Baptista 2020; Castanheira and Baptista 2021a, b; Cargnelutti et al. 2022). Summing up, the current distribution of species in South American countries (or regions) studied here and in past publications is Argentina (13 species), Brazil (20 species), French Guiana (two species), Guyana (five species), Paraguay (five species), Uruguay (three species) and Venezuela (five species). The revision of Brazilian and Argentinian *Tetragnatha* provides a very good baseline to expand the taxonomic treatment into other South American countries (Bolivia, Chile, Colombia, Ecuador, Peru and Suriname) and to the remaining Neotropical region.

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References

Álvarez-Padilla F, Hormiga G (2008) A protocol for digesting internal soft tissues and mounting spiders for scanning electron microscopy. Journal of Arachnology 35: 538–542. https://doi.org/10.1636/Sh06-55.1

Álvarez-Padilla F, Hormiga, G (2011) Morphological and phylogenetic atlas of the orb-weaving spider family Tetragnathidae (Araneae: Araneoidea). Zoological Journal of the Linnean Society 162(4): 713–879. https://doi.org/10.1111/j.1096-3642.2011.00692.x

Álvarez-Padilla F, Kallal RJ, Hormiga G (2020) Taxonomy and phylogenetics of Nanometinae and other Australasian orb-weaving spiders (Araneae: Tetragnathidae). Bulletin of the American Museum of Natural History 438: 1–107. https://doi.org/10.1206/0003-0090.438.1.1

Álvarez-Padilla F, Dimitrov D, Giribet G, Hormiga G (2009) Phylogenetic relationships of the spider family Tetragnathidae (Araneae, Araneoidea) based on morphological and DNA sequence data. Cladistics 25: 109–146. https://doi.org/10.1111/j.1096-0031.2008.00242.x

Audouin V (1826) Explication sommaire des planches d'arachnides de l'Égypte et de la Syrie. In: Description de l'Égypte, ou recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française, publié par les ordres de sa Majesté l'Empereur Napoléon le Grand. Paris: Ed. Imprimerie Impériale. Histoire Naturelle 1(4): 1–339.

Bertkau P (1880) Verzeichniss der von Prof. Ed. van Beneden auf seiner im Auftrage der Belgischen Regierung unternommen wissenschaftlichen Reise nach Brasilien und La Plata im Jahren 1872–73 gesammelten Arachniden. Mémoires Couronnés et Mémoires des Savants Étrangers de l'Académie Royale des Sciences, des Lettres et des Beaux-Arts de Belgique 43: 1–120.

Bonnet P (1959) Bibliographia araneorum. Analyse méthodique de toute la littérature aranéologique jusqu'en 1939. Tome II. Systématique des araignées (Étude par ordre alphabétique) (5ème partie: T–Z). Douladoure, Toulouse, 4231–5058.

Bryant EB (1945) The Argiopidae of Hispaniola. Bulletin of the Museum of Comparative Zoology 95: 357–422.

Cabra-García J, Brescovit AD (2016) Revision and phylogenetic analysis of the orb-weaving spider genus *Glenognatha* Simon, 1887 (Araneae, Tetragnathidae). Zootaxa 4069(1): 1–183. https://doi.org/10.11646/zootaxa.4069.1.1

Čandek K, Agnarsson I, Binford GJ, Kuntner M (2021) Biogeography of Long-Jawed Spiders Reveals Multiple Colonization of the Caribbean. Diversity 13: 622. https://doi.org/10.3390/d13120622

Caporiacco L di (1947) Diagnosi preliminari de specie nuove di aracnidi della Guiana Brittanica raccolte dai professori Beccari e Romiti. Monitore Zoologico Italiano 56: 20–34.

Caporiacco L di (1948) Arachnida of British Guiana collected in 1931 and 1936 by Professors Beccari and Romiti. Proceedings of the Zoological Society of London 118(3): 607–747. https://doi.org/10.1111/j.1096-3642.1948.tb00402.x

Cargnelutti F, Bollatti F, Izquierdo MA, Castanheira PdS, Baptista RLC, Barrantes G, Aisenberg A (2022) Together but not intertwined: differences in sexual behavior between two sympatric and synchronic spider species, including one new synonymy (Araneae: Tetragnathidae: *Tetragnatha*). Journal of Arachnology 50(1): 67–80. https://doi.org/10.1636/JoA-S-21-006

Castanheira PdS (2020) Taxonomic Revision of the Cisandine Species of *Tetragnatha* Latreille, 1804 (Arachnida: Araneae: Tetragnathidae). PhD Thesis, Museu Nacional (Universidade Federal do Rio de Janeiro), Rio de Janeiro, 250 pp.

Castanheira PdS, Baptista RLC (2020) Notes on slender species of the long-jawed spider genus *Tetragnatha* (Araneae, Tetragnathidae) with description of three new species. Zootaxa 4768(1): 43–75. https://doi.org/10.11646/zootaxa.4768.1.4

Castanheira PdS, Baptista, RLC (2021a) Tailed species of the orb-weaving spider genus *Tetragnatha* (Araneae: Tetragnathidae) in the Neotropical region. Arachnology 18(7): 649–655. https://doi.org/10.13156/arac.2020.18.7.649

Castanheira PdS, Baptista RLC (2021b) Redescription of *Tetragnatha guatemalensis*, *T. laboriosa* and *T. jaculator*, with new synonymies of genus *Tetragnatha* (Araneae: Tetragnathidae) in the Neotropical region. Journal of Natural History 54(47–48): 3031–3057. https://doi.org/10.1080/00222933.2021.1890252

Castanheira PdS, Baptista RLC, Pizzeti, DdP, Teixeira RA (2019) Contributions to the taxonomy of the long-jawed orb-weaving spider genus *Tetragnatha* (Araneae, Tetragnathidae) in the Neotropical region, with comments on the morphology of the chelicerae. Zoosystematics and Evolution 95(2): 465–505. https://doi.org/10.3897/zse.95.36762

Chickering AM (1957a) Notes on certain species of *Tetragnatha* (Araneae, Argiopidae) in Central America and Mexico. Breviora 67: 1–4.

Chickering AM (1957b) The genus *Tetragnatha* (Araneae, Argiopidae) in Jamaica, B.W.I., and other neighboring islands. Breviora 68: 1–15.

Chickering AM (1957c) The genus *Tetragnatha* (Araneae, Argiopidae) in Panama. Bulletin of the Museum of Comparative Zoology at Harvard College 116: 301–354

Clerck C (1757) Svenska spindlar, uti sina hufvud-slågter indelte samt under några och sextio särskildte arter beskrefne och med illuminerade figurer uplyste. Stockholm, Ed. L. Salvius, 154 pp. https://doi.org/10.5962/bhl.title.119890

Díaz CF (2019) Naturalistas en el Chile Decimonónico. Chile, Santiago, Ed. Centro de Investigaciones PEIP, 179 pp.

Dimitrov D, Hormiga G (2009) Revision and cladistic analysis of the orbweaving spider genus *Cyrtognatha* Keyserling, 1881 (Araneae, Tetragnathidae). Bulletin of the American Museum of Natural History 317: 1–140. https://doi.org10.1206/317.1

Dimitrov D, Hormiga G (2011) An extraordinary new genus of spiders from Western Australia with an expanded hypothesis on the phylogeny of Tetragnathidae (Araneae). Zoological Journal of the Linnean Society 161(4): 735–768. https://doi.org/10.1111/j.1096-3642.2010.00662.x

Dimitrov D, Álvarez-Padilla F, Hormiga G (2008) Until dirt do us apart: on the unremarkable palp morphology of the spider *Sternospina concretipalpis* Schmidt & Krause, 1993, with comments on the genus *Prionolaema* Simon, 1894 (Araneae, Tetragnathidae). Zootaxa 1698: 49–56. https://doi.org/10.11646/zootaxa.1698.1.3

Dimitrov D, Benavides LR, Arnedo MA, Giribet G, Griswold CE, Scharff N, Hormiga G (2017) Rounding up the usual suspects: a standard target-gene approach for resolving the interfamilial phylogenetic relationships of ecribellate orb-weaving spiders with a new family-rank classification (Araneae, Araneoidea). Cladistics 33(3): 221–250 [& Suppl] https://doi.org/10.1111/cla.12165

Dondale CD, Redner JH, Paquin P, Levi HW (2003) The insects and arachnids of Canada. Part 23. The orb-weaving spiders of Canada and Alaska (Araneae: Uloboridae, Tetragnathidae, Araneidae, Theridiosomatidae). NRC Research Press Ottawa, 371 pp.

Emerton JH (1884) New England spiders of the family Epeiridae. Transactions of the Connecticut Academy of Arts and Sciences 6: 295–342. https://doi.org/10.5962/bhl.part.7413

Gillespie RG (1992a) Hawaiian spiders of the genus *Tetragnatha*: I. Spiny leg clade. Journal of Arachnology 19: 174–209.

Gillespie RG (1992b) Hawaiian spiders of the genus *Tetragnatha* II. Species from natural areas of windward east Maui. Journal of Arachnology 20: 1–17.

Gillespie RG (2003a) Hawaiian spiders of the genus *Tetragnatha* (Araneae: Tetragnathidae): V. Elongate web-builders from Oahu. Journal of Arachnology 31: 8–19. https://doi.org/10.1636/0161-8202(2003)031[0008:HSOTGT]2.0.CO;2

Gillespie RG (2003b) Marquesan spiders of the genus *Tetragnatha* (Araneae: Tetragnathidae). Journal of Arachnology 31: 62–77. https://doi.org/10.1636/0161-8202(2003)031[0062:MSOTGT]2.0.CO;2

Gillespie RG (2003c) Spiders of the genus *Tetragnatha* (Araneae: Tetragnathidae) in the Society Islands. Journal of Arachnology 31: 157–172. https://doi.org/10.1636/0161-8202(2003)031[0157:SOTGTA]2.0.CO;2

Hentz NM (1850) Descriptions and figures of the araneides of the United States. Boston Journal of Natural History 6: 18–35, 271–295.

International Commission on Zoological Nomenclature (1999) International Code of Zoological Nomenclature. London, UK, The International Trust for Zoological Nomenclature.

Keyserling E (1865) Beiträge zur Kenntniss der Orbitelae Latr. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 15: 799–856.

Keyserling E (1881) Neue Spinnen aus Amerika. III. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 31: 269–314. https://doi.org/10.5962/bhl.part.20318

Koch L (1872) Die Arachniden Australiens, nach der Natur beschrieben und abgebildet [Erster Theil, Lieferung 3–7]. Bauer & Raspe, Nürnberg, 105–368. [pl. 8–28] https://doi.org/10.5962/bhl.title.121660

Latreille PA (1804) Tableau methodique des Insectes. Paris, Ed. Dufart. Nouveau Dictionnaire d'Histoire Naturelle 24: 129–295.

Lendl A (1886) A magyarországi *Tetragnatha*-félékröl. Species subfamiliae Tetragnathinarum faunae Hungaricae. Mathematikai és Természettudományi Közlemények 22: 119–156.

Levi HW (1967) The theridiid spider fauna of Chile. Bulletin of the Museum of Comparative Zoology 136: 1–20.

Levi HW (1981) The American orb-weaver genera *Dolichognatha* and *Tetragnatha* north of Mexico (Araneae: Araneidae, Tetragnathinae). Bulletin of the Museum of Comparative Zoology at Harvard College 149: 271–318.

Levi HW (1986) The Neotropical orb-weaver genera *Chrysometa* and *Homalometa* (Araneae: Tetragnathidae). Bulletin of the Museum of Comparative Zoology 151: 91–215.

Levi HW (2001) The orbweavers of the genera *Molinaranea* and *Nicolepeira*, a new species of *Parawixia*, and comments on orb weavers of temperate South America (Araneae: Araneidae). Bulletin of the Museum of Comparative Zoology 155: 445–475.

Levi HW (2008) On the tetragnathid genera *Alcimosphenus*, *Leucauge*, *Mecynometa* and *Opas* (Araneae, Tetragnathidae). Journal of Arachnology 36: 167–170. https://doi.org/10.1636/A07-67SC.1

Linnaeus C (1758) Systema naturae per regna tria naturae, secundum classes, ordines, genera, species cum characteribus differentiis, synonymis, locis. Editio decima, reformata. (Araneae, pp. 619–624). Stockholm, Ed. L. Salvius, 821 pp. https://doi.org/10.5962/bhl.title.542

Mello-Leitão CF de (1931) Notas sobre arachnidos argentinos. Anais da Academia Brasileira de Ciências 3: 83–97.

Mello-Leitão CF de (1939) Araignées américaines du Musee d'histoire naturelle de Bâle. Revue Suisse de Zoologie 46: 43–93. https://doi.org/10.5962/bhl.part.117928

Mello-Leitão CF de (1945) Arañas de Misiones, Corrientes y Entre Ríos. Revista del Museo de La Plata (N. S., Zool.) 4: 213–302.

Menge A (1866) Preussische Spinnen. Erste Abtheilung. Schriften der Naturforschenden Gesellschaft in Danzig (N.F.) 1: 1–152.

Nicolet (1849) Aracnidos. In: Gay C (Ed.) Historia física y política de Chile. Paris, Ed. Maude y Renou. Zoología 3: 319–543. [pl. 1–5]

Okuma C (1983) New synonymies and new records of some cosmopolitan species of the genus *Tetragnatha* (Araneae: Tetragnathidae). Esakia 20: 69–80. https://doi.org/10.5109/2437

Okuma C (1987) A revision of the Australasian species of the genus *Tetragnatha* (Araneae, Tetragnathidae). Esakia 25: 37–96. https://doi.org/10.5109/2493

Okuma C (1988a) A revision of the genus *Tetragnatha* Latreille (Araneae, Tetragnathidae) of Asia, Part I. Journal of the Faculty of Agriculture Kyushu University 32: 165–181. https://doi.org/10.5109/23876

Okuma C (1988b) A revision of the genus *Tetragnatha* Latreille (Araneae, Tetragnathidae) of Asia, Part II. Journal of the Faculty of Agriculture Kyushu University 32: 183–213. https://doi.org/10.5109/23877

Okuma C (1992) Notes on the Neotropical and Mexican species of *Tetragnatha* (Araneae: Tetragnathidae) with descriptions of three new species. Journal of the Faculty of Agriculture Kyushu University 36: 219–243. https://doi.org/10.5109/23987

Paquin P, Dupérré N (2003) Guide d'identification des araignées de Québec. Fabreries, Supplement 11: 1–25.

Pickard-Cambridge O (1889) Arachnida. Araneida. In: Biologia Centrali-Americana. London. Zoology 1: 1–56.

Roewer CF (1942) Katalog der Araneae von 1758 bis 1940. 1. Band (Mesothelae, Orthognatha, Labidognatha: Dysderaeformia, Scytodiformia, Pholciformia, Zodariiformia, Hersiliaeformia, Argyopiformia). Natura, Buchhandlung für Naturkunde und exakte Wissenschaften Paul Budy Bremen, 1040 pp.

Seeley RM (1928) Revision of the spider genus Tetragnatha. New York State Museum Bulletin 278: 99–150.

Simon E (1887) Observation sur divers arachnides: synonymies et descriptions. Annales de la Société Entomologique de France 7(Bull.) (6): 158–159, 167, 175–176, 186–187, 193–195.

Simon E (1890) Etudes arachnologiques. 22e Mémoire. XXXVI. Arachnides recueillis aux îles Mariannes par M. A. Marche. Annales de la Société Entomologique de France (6)10: 131–136.

Simon E (1893) Arachnides de l'archipel Malais. Revue Suisse de Zoologie 1: 319–328. https://doi.org/10.5962/bhl.part.3747

Simon E (1896) Etude sur les Arachnides du Chili. Premier mémoire. Actes de la Société Scientifique du Chili 6: 63–70. [CIV–CVII]

Simon E (1902) Arachnoideen, excl. Acariden und Gonyleptiden. In: Ergebnisse der Hamburger Magalhaensischen Sammelreise 1892/1893. Hamburg, L. Ed. Friederichsen & Co. Band Arthropoden 6(4): 1–47.

Simon E (1904) Etude sur les arachnides du Chili recueillis en 1900, 1901 et 1902, par MM. C. Porter, Dr Delfin, Barcey Wilson et Edwards. Annales de la Société Entomologique de Belgique 48: 83–114.

Simon E (1905) Etude sur les arachnides recueillis en Patagonie par le Dr. Fillipo Silvestri. Bollettino dei Musei di Zoologia ed Anatomia Comparata della Reale Università di Torino 20 (511): 1–18. https://doi.org/10.5962/bhl.part.9304

Sundevall CJ (1823) Specimen academicum genera araneidum Sueciae exhibens. C. F. Berling, Lundae [= Lund], 1–22.

Thorell T (1890) Arachnidi di Pinang raccolti nel 1889 dai Signori L. Loria e L. Fea. Annali del Museo Civico di Storia Naturale di Genova 30: 269–383.

Tullgren A (1910) Araneae. In: Wissenschaftliche Ergebnisse der Schwedischen Zoologischen Expedition nach dem Kilimandjaro, dem Meru und den umgebenden Massaisteppen Deutsch-Ostafrikas 1905–1906 unter Leitung von Prof. Dr. Yngve Sjöstedt. Sjöstedts Kilimandjaro-Meru Expedition 20(6): 85–172. https://doi.org/10.5962/bhl.title.6622

Walckenaer CA (1841) Histoire naturelle des Insects. Paris. Aptères 2: 1–549. https://doi.org/10.5962/bhl.title.61095

Wiehle H (1939) Die einheimischen Tetragnatha Arten. Nova Acta Leopoldina, Abhandlungen der Kaiserlich Leopoldinisch-Carolinisch Deutschen Akademie der Naturforscher (N. F.) 6: 363–386.

Wiehle H (1963) Spinnentiere oder Arachnoidea (Araneae). XII. Tetragnathidae-Streckspinnen und Dickkiefer. Jena, Ed. G. Fischer. Die Tierwelt Deutschlands 49: 1–76.

World Spider Catalog (2022) World Spider Catalog. Version 23.5. Natural History Museum Bern. http://wsc.nmbe.ch [accessed on August 03, 2022]

Zhu MS, Zhang BS (2011) Spider fauna of Henan: Arachnida: Araneae. Beijing, Science Press, 558 pp.

Zhu MS, Song DX, Zhang JX (2003) Fauna Sinica: Invertebrata Vol. 35: Arachnida: Araneae: Tetragnathidae. Beijing, Science Press, 418 pp.